FEB 4 1929

News of the Industry Begins Page 176

AUTOMOTIVE INDUSTRIES

Volume 60
Number 5

PUBLISHED WEEKLY AT CHESTNUT AND 56TH STREETS
PHILADELPHIA, FEBRUARY 2, 1929

35c a copy
$3.00 a year

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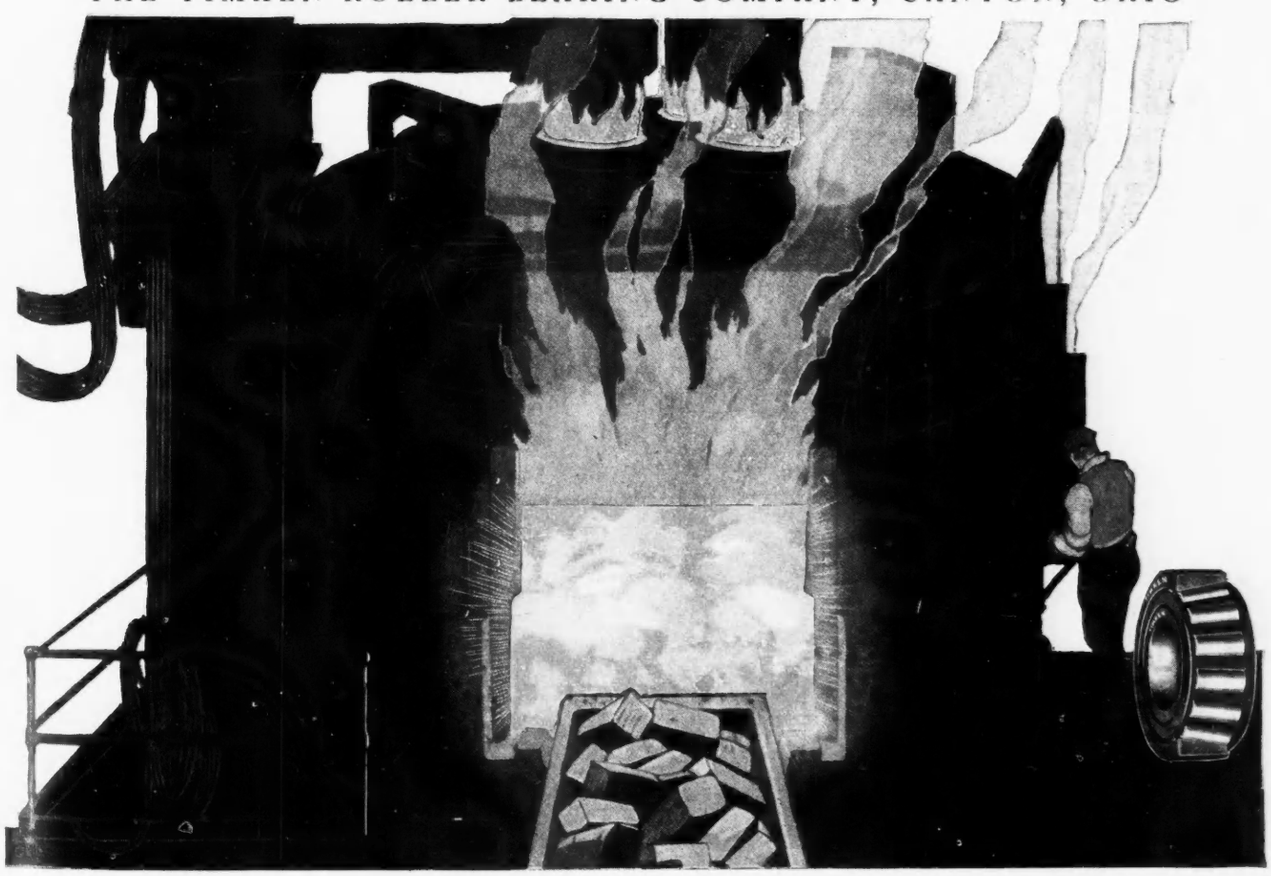

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Vol. 60 No. 5

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Automotive Industries is published every Saturday by
CHILTON CLASS JOURNAL COMPANY
Chestnut and 56th Streets, Philadelphia, Pa.

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Owned by United Publishers Corporation, 239 West 39th Street, New York; ANDREW C. PEARSON, Chairman, Board of Directors; FRITZ J. FRANK, President; C. A. MUSSELMAN, Vice-President; F. C. STEVENS, Treasurer.

SUBSCRIPTION RATES: United States, Mexico and U. S. Possessions, $3.00 per year; Canada, $5.00 per year; all other countries in Postal Union, $6.00 per year. Single Copies, 35 cents.

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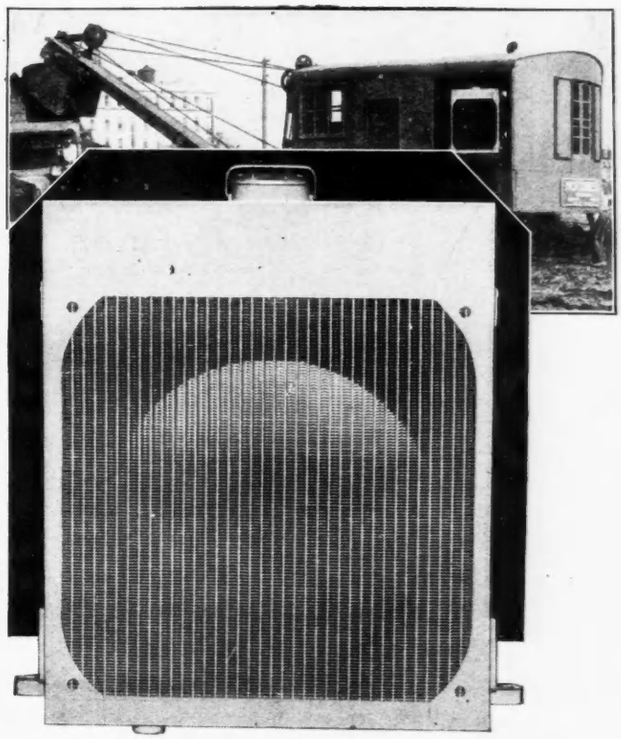
Automotive Industries — The Automobile is a consolidation of the Automobile (monthly) and the Motor Review (weekly), May, 1902; Dealer and Repairman (monthly), October, 1903; the Automobile Magazine (monthly), July, 1907, and the Horseless Age (weekly), founded in 1895, May, 1918.



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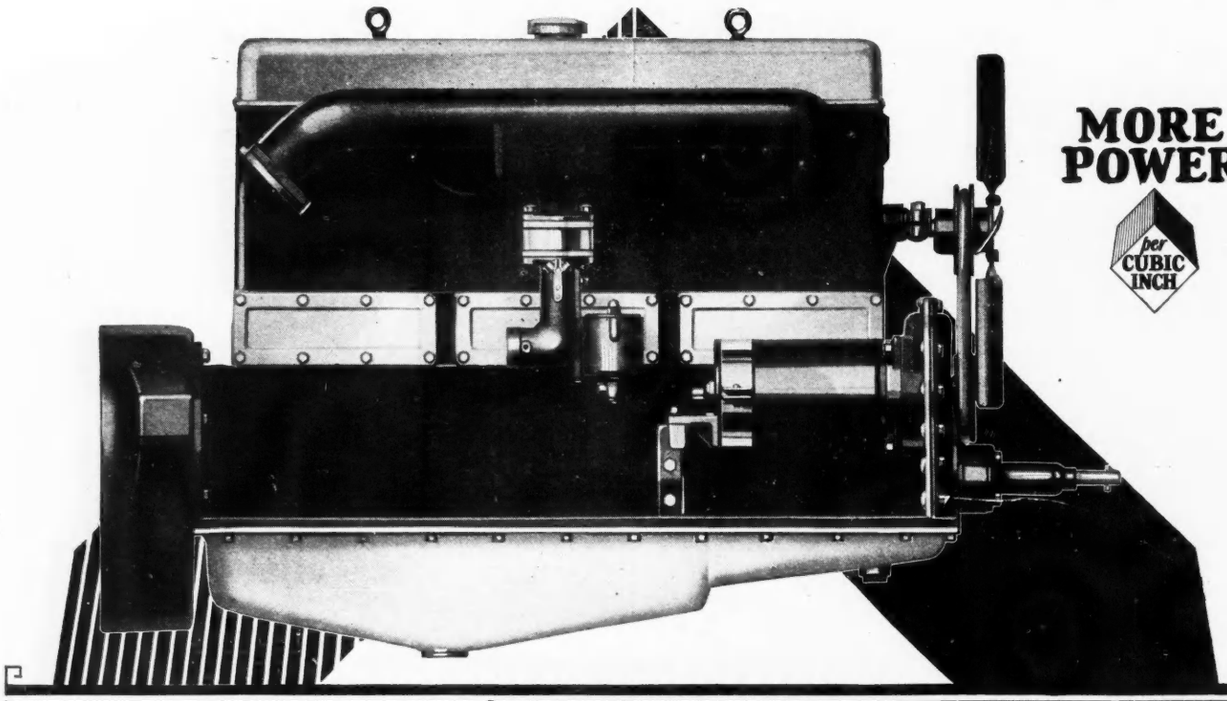

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AUTOMOTIVE INDUSTRIES
VOLUME 60 *Philadelphia, Saturday, February 2, 1929* NUMBER 5

Atmosphere at *Chicago* Show One of Optimism

Factory men pleased with January sales and see continuance of favorable business conditions. Exhibit at Coliseum has competition in numerous outside showings.

By Norman G. Shidle

THE industry displayed its new products in the West this week in a fine, attractive setting at the twenty-ninth annual Chicago National Automobile Show, which opened Saturday afternoon, Jan. 26.

The opening day at the Coliseum in Chicago was much like that in New York; an interested crowd waited for the doors to open on the new products but the total attendance for the early days of the exhibit was not record-breaking. It would not be surprising if final figures proved the Chicago exhibit to be another in the list of 1929 shows whose attendance totaled less than in 1928; several of the local shows already have been in that category.

General view of main floor at 1929 Chicago Show

About 300 models were displayed by 44 makers, including the taxicab exhibits. There were 232 parts and accessory and shop equipment exhibits.

With the new products on display with few exceptions identical with those exhibited in New York, chief interest among factory executives seemed to center around trade gossip, business trends and discussion of the effect of the numerous hotel exhibits on the show itself as a continuing successful spectacle.

Car prices remained stable during the opening days of the show, very few revisions of any kind having been announced Saturday.

A general atmosphere of continued optimism prevailed among factory men in Chicago, due, not only to the persistence of those favorable general business conditions which caused the outlook to be bright as the year opened, but also because of the satisfactory January sales totals which have been run up by a majority of the manufacturers. While sales in every line have not exceeded those of January last year, quite specific conditions can be pointed to as the cause of the relatively few decreases recorded.

Further dealer showings of the Marmon-built Roosevelt and of the Oldsmobile-built Viking, together with authoritative trade gossip of at least four other important new models in the offing, portended a continuance of public new model announcements throughout the spring and early summer.

Few actual changes in factory personnel were announced on the opening days of the Chicago Show, but there were indications that the usual early-year shifting about of minor executives would transpire.

The hotel and outside exhibits in Chicago were even more numerous than last year and gave every indica-

tion of drawing increased crowds despite smaller attendance at the show itself on the opening days. General Motors again had its big exhibit at the Stevens, Ford once more filled the 131st Armory with his products, Chrysler returned to the Congress and Graham-Paige to the Blackstone with special exhibits, while Packard displayed at the "333" Building, Hudson-Essex at 1006 Michigan Ave., and Dodge at 1519 S. Wabash Ave. Henney Motor Co. had an exhibit at the Auditorium Hotel.

Difference of opinion among executives still exists as regards the extra-show exhibits. Some are unalterably opposed to such exhibits in general; others are inclined to favor them at almost any cost; while a good many others visualize them simply as desirable and necessary additions to the regular show where all models of present widespread lines simply cannot be shown. There seems to be little doubt of the adverse effect on the show proper of extensive outside exhibits after several years' experience with them. The question would seem to rest then on whether or not, viewed from the standpoint of the industry as a whole, the harm done to the show itself is more than offset by the advantages gained through the extra-show exhibitions. It would seem almost inevitable that further serious discussion of this point should arise in National Automobile Chamber of Commerce councils in the near future.

Several parts and accessory company mergers were in the wind as the show opened but no definite conclusion to negotiations had been arrived at. It is reasonable to expect a continuance during 1929 of the trend toward combination and consolidation among supply makers which gained such marked headway last year.

Only one completely new car not previously described in *Automotive Industries* was found at the Coliseum. The Roamer "120," on a 136-in. wheelbase, shown in a seven-passenger limousine form, followed to some extent former Roamer lines, with the characteristic radiator shell. As last year it is fitted with a Lycoming 3¼ by 4½ in. engine, single-plate clutch, three-speed gearset, metal universals and semi-floating bevel drive rear axle. Noise insulation is represented by rubber mounting of the engine and the use of Belflex shackles in the spring suspension. Tubular cross-members are found at both front and rear end of the frame for stiffness at these points.

Of the chassis equipment, the electrical units are now of Delco-Remy manufacture, the distributor being of the now popular eight-cylinder double-breaker twin-four ignition type. A Purolator is fitted to the engine, while the supply tank for the Lockheed external four-wheel brakes is mounted on the front of the dash. Fuel supply is by vacuum. A Schebler carburetor and built-in thermostat completes the engine equipment. A round belt to drive the fan is a deviation from customary practice. It does not drive the water pump, the latter unit being mounted back of the generator.

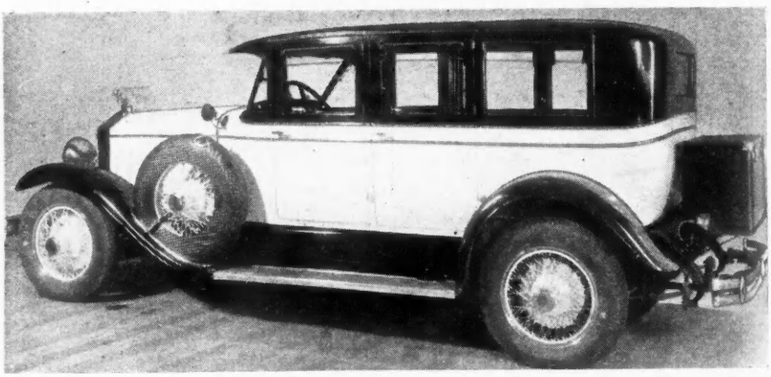
A number of interesting features are found in the body design. Windshields as formerly are of the slope-in, side-paneled type. The sun visor is sharply curved, following the roof line. Instead of the usual hood-lift grips, a long chrome-plated lifter bar is attached to the hood. Radiators are braced from the cylinder head. Eave-type window-glass ventilators are fitted to all side windows, to assure good ventilation in rainy weather. On the model shown, the auxiliary seats fold up, the left seats being designed for sideways, and the right for backward sitting posture.

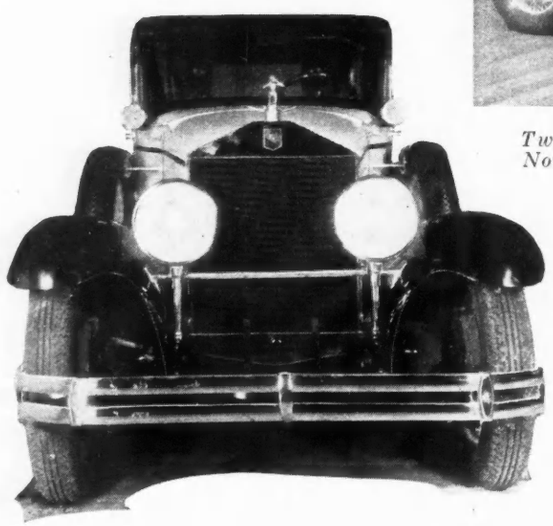
Glass Lowered by Crank

A crank is provided for lowering the partitioning glass between front and rear compartments. It, as well as rear quarter windows, is provided with a draw shade. Standard equipment includes dash temperature and gasoline gage, clock, cigar lighter, Lovejoys, bumpers front and rear, combination tail and stop-light, Hall twin-filament headlights, top cowl ventilator, electric telephone between front and rear compartments, small dome lights immediately inside the rear doors, windshield wiper, mirror, arm rest, assist cords, and cowl lights and bands. The model shown was fitted with a rack and trunk, and six wire wheels, the spares carried in fender wells, and mounting 6.50/20 balloons.

Nash exhibited for the first time a new Special Six roadster with rumble seat, priced at $1,345. Being the first roadster to be shown on the new "400" line of cars, it attracted quite a little attention. Hudson Motor Car Co. also exhibited two models, announced formerly in these columns, but shown here for the first time. These were a convertible rumble seat coupe on the Hudson and a similar model on the Essex chassis.

Due to the limited space available at the Coliseum, some of the new body models were not shown there, but at distributor or branch headquarters. This applied to both Graham-Paige and Lincoln. The former company had at its branch a roadster and phaeton on the 621 chassis, already announced but not formerly



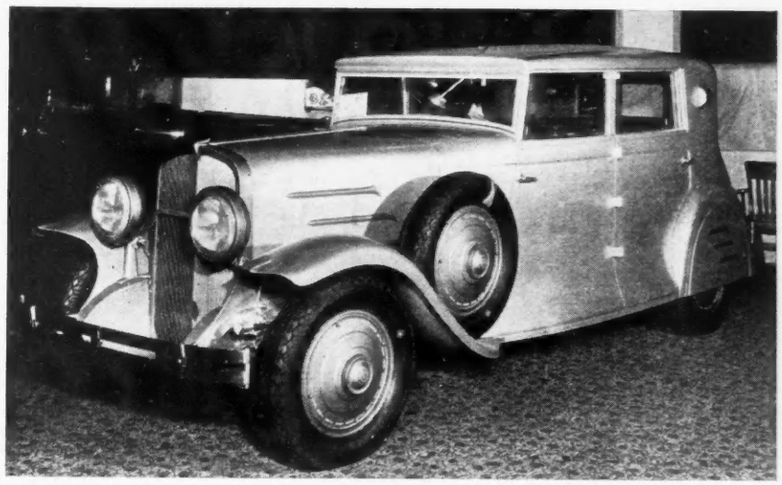


Two views of the new Roamer "120" seven-passenger limousine. Note the use of ventilating eaves as shown in the side view above

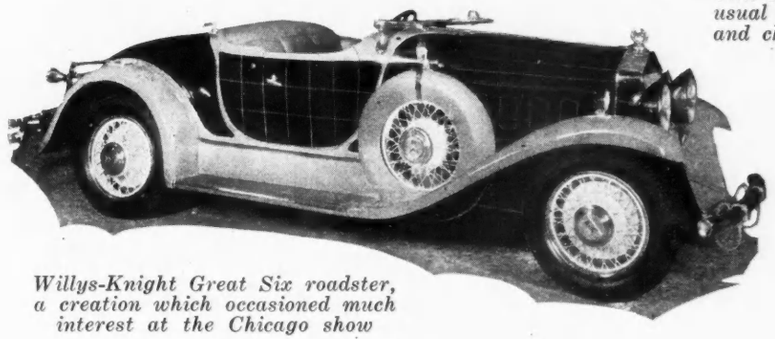
shown. In the case of Lincoln, the body model was a new five-passenger sedan, fitting in between the brougham and seven-passenger model in size and price.

Cadillac's complete line of body models was noted to have been increased by one more model at the show. A Fisher-body Imperial landau cabriolet, finished in jet black with white pin striping, and with tan collapsible rear quarter, was the latest addition. A four-door seven-passenger model, it was shown equipped with six wire wheels and chrome-plated trunk rack.

New developments in body design exhibited at the Automobile Salon, held as usual in the Drake Hotel simultaneously with the Coliseum show, indicated that the production rate of builders of custom bodies has gained in response to the increasing popularity of individual and distinctive body models. An exceptional number of improvements and design changes were seen at the Chicago salon that were not shown at the New York salon two months ago.



This Franklin "Pirate" is one of the most unusual cars of the year. All protruding body and chassis parts are inclosed by the use of sheet aluminum



Willys-Knight Great Six roadster, a creation which occasioned much interest at the Chicago show

Mercedes-Benz struck a unique note with an imperial limousine, listed at $32,500, which was said to lead the field in price. It was a product of Saoutchik of Paris mounted on the standard six-cylinder Mercedes-Benz chassis. The engine was equipped with a supercharger and the car is guaranteed to be capable of 100 m.p.h.

Japanese Panel Work

Japanese hand-painting and panels featured the body. The panel work was on Santo Domingo white mahogany. Two of the largest panels concealed the two extra seats. All of the interior fittings and the inlay figures were of tortoise shell. The silk velour covering of the rear seat carried decorations of hand-embroidered Japanese King Pheasants in red, gold and blue. The rear seat was adjustable so as to accommodate the extra seats in the rear compartment. It was indirectly lighted with switch controls on the dash panel and by the rear seat. The windows, which were of European non-shatterable glass, were in frames adjustable by gears that were claimed to make them rattle-proof. The car carried a dictaphone system for communication between passengers and the chauffeur.

A sporting Model S also exhibited by Mercedes-Benz carried a radio set with loud speaker. The car was guaranteed to be capable of 120 m.p.h. The body was by Fleetwood and was set off by airplane fenders. The engine was equipped with two carburetors, a supercharger and double ignition. As on a number of other cars seen at the salon, the lights and horn were controlled by a ring on the steering wheel.

Pierce-Arrow showed a transformable town car by Willoughby on its new 143-in. wheelbase chassis. The body was black with chromium-colored molding.

On its 145-in. chassis, Packard displayed a convertible sedan by Dietrich priced at $6,995. On a chassis of the same size, Packard showed an all-weather cabriolet by Rollston priced at $9,370. Also on a de luxe Packard chassis was a six-passenger Berline by Judkins priced at $6,760. It can be either owner or chauffeur-driven.

Minerva had three models at the salon. An all-weather town car by D'Ieteren, of Brussels, was shown on a 149⅝-in. wheelbase. The interior paneling was of walnut. The car was priced at $14,500. On a similar chassis was displayed an imperial limousine by D'Ieteren, which also was priced at $14,500. The third model was a fully convertible royal town car with a body by Floyd-Derham, Inc., priced at $15,500.

A new seven-passenger Berline body by Judkins was displayed on a Stearns-Knight chassis. It was priced at $9,235. The lower panels were of twilight blue while the superstructure was Duco black. The windshield was pivoted one-third of the distance down from its top in a manner intended to give ventilation both above and below when it is open.

Brewster bodies shown by Rolls-Royce included the Kenilworth, Lonsdale, Newmarket, St. Alban, St. Stephen, and Salamanca de Ville. A speedster with a body by Murphy of Sacramento also was shown by Rolls-Royce. The Lincoln airplane model by LeBaron that was a feature of the New York salon also was seen in Chicago. Duesenberg displayed half a dozen new body models, three of which carried Murray bodies while two were of Holbrook design. Considerable attention was attracted by a LeBaron sports model.

Eighty-two vehicles were shown at the Chicago salon as compared with 92 at the New York salon. A number of the cars displayed at the former were sold before the exposition had been open four hours to prospects who had been urged to visit the exposition early in order to have a free choice. Heavy sales at the New York salon were credited with being largely responsible for the scant number of cars shown in New York that were brought to the Chicago debut.

Rapid Development Taking Place in Marine Engine Design

Exhibits of outboard powerplants at New York Motor Boat Show reveal surprising progress with operating speeds as high as 6000 r.p.m. in some cases. Two cycle types.

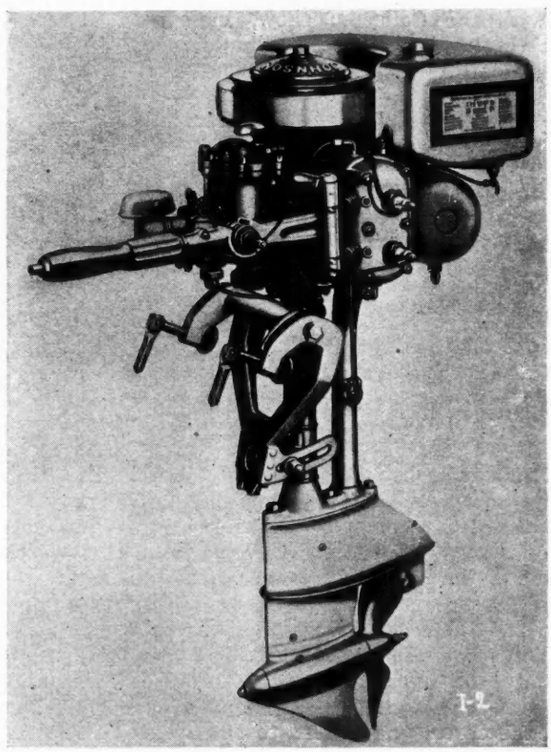
ANYBODY generally familiar with engine design who has not followed closely the development of types suited to watercraft will be amazed at the interest taken today in the outboard powerplants which have come with a rush in that field. Such engines were the center of popular interest at the annual Motor Boat Show in New York. They range from the small 2 or 3 hp. type, in which they have existed for many years, up to 30 hp. or more.

Nearly all are of the two-cycle type with either two or four opposed cylinders, but there is one five-cylinder four-cycle job known as the Cross Radial and at least one other make (the Lockwood Motor Co.) is promising a new four-cylinder four-cycle type by April.

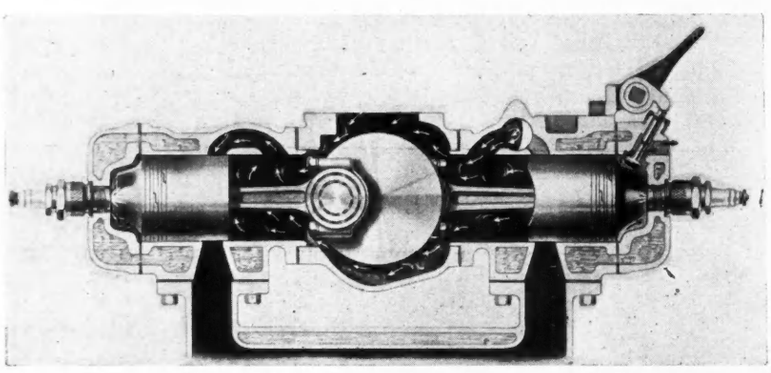
Surprising as it may seem, some of these engines are reported to be capable of operating at speeds in excess of 6000 r.p.m., though developing maximum power at about 5200. Such speeds appear to be feasible with an engine so well balanced as the opposed type, but how long a life such engines will have at these speeds is another question.

A factor which has added to the desirability of the outboard engine for general as compared to racing use, is the development of underwater exhausts which are said to be absolutely silent. The exhaust in these engines is carried from a muffler bolted beside or below and aft of the cylinders and thence through a pipe discharging through a terminal casing which usually is a part of the housing for the propeller shafts. In at least one case water is pumped up and through to the muffler and discharged into the tail-pipe just below. This tends to reduce back pressure and maintain a lower temperature. One manufacturer producing an outboard engine with under-water exhaust claims that the pressure in the muffler is below atmosphere.

Even the small outboard engine cylinders are water-cooled and ingenious use is made of pressure differences to secure water circulation without using a separate pump. In some cases the water inlet is placed just aft of the propeller wheel while the outlet is just forward of the wheel. In others, the propeller is cast hollow with openings on its forward surfaces so that it acts as a centrifugal pump. Then the inlet is placed on the forward side of the propeller shaft housing and the discharge is through the propeller itself.



Johnson outboard marine engine

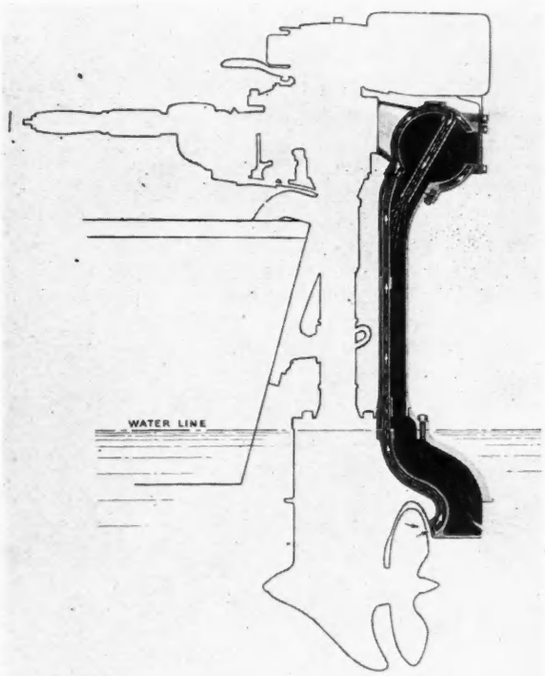


Section of Johnson two-stroke engine showing "release charger"

One of the latest outboard designs is that known as the Johnson "Sea Horse," made in several sizes with either two or four cylinders. The largest of these, when in racing trim, is said to develop 32 hp. at 5200 r.p.m. It has four cylinders of 2⅜-in. bore. The stroke is 2¼ in.; displacement 39.86 cu. in. Cylinders are cast in pairs and honed to close limits. Cylinder heads are detachable and cast from aluminum alloy. Lynite pistons, roller bearing crankpin, case-hardened

crankshaft and aluminum crankcase are employed. A notable feature is the cylindrical rotary valve, driven at crankshaft speed, which provides a positive control of the admission of charge to the crankcase. This valve is timed so that it remains open 180 deg., or for the entire outward stroke of the pistons. The makers state that this valve is responsible for an increase of nearly 50 per cent in power in this year's as compared to 1928 engines, the increase presumably resulting from the higher speeds at which the engine is capable of operating, as compared to the older three-port types.

Another new feature on this engine is the use of a so-called "Release Charger," a device which opens a compression release poppet valve in the head of cylinders at one side, at the same time closing the transfer ports to those cylinders, thus forcing an extra charge into cylinders on the opposite side. This, of course, is designed to facilitate starting.



Under-water exhaust for outboard-type marine engine

The 32 hp. Johnson Sea Horse is said to weigh only 110 lb. It lists at $325. A stainless steel muffler is included as standard equipment.

It is common practice to provide a propeller shaft housing of Lynite or some other aluminum alloy which resists corrosion. These housings are neatly streamlined and usually are cored to provide passages for water and for exhaust outlet as well as to accommodate the bevel gearing, shafts and bearings.

As might be expected, the coming of higher powered outboard engines is having its effect upon the manufacturers of the smaller inboard engines. One of them, Van Blerck Motors, Inc., is answering with a "portable" four-cylinder four-cycle vertical engine weighing only 100 lb., or slightly less than the larger outboard jobs.

This engine, listing at $265, is virtually an all-aluminum job, except for semi-steel cylinder liners and moving parts. It has a 2 11/16-in. bore and 3½-in. stroke (79.4 cu. in. displacement) and uses four valves per cylinder, actuated by a chain-driven overhead camshaft. All working parts are fully inclosed. It is said to consume about half as much fuel as the two-stroke cycle outboard engines of equal power.

Several concerns well known as builders of automobile engines are represented in the marine field, some of them having entirely new marine engines.

Lycoming, for example, presents a new eight-in-line using the same cylinder block, pistons and crankshaft employed in the engine built for Auburn. This is known as Model UD and has 3¼-in. bore and 4½-in. stroke (298.6 cu. in. displacement) and is said to develop 115 hp. at 3000 r.p.m. Weight is 960 lb. and equipment includes an AC fuel pump driven off the camshaft.

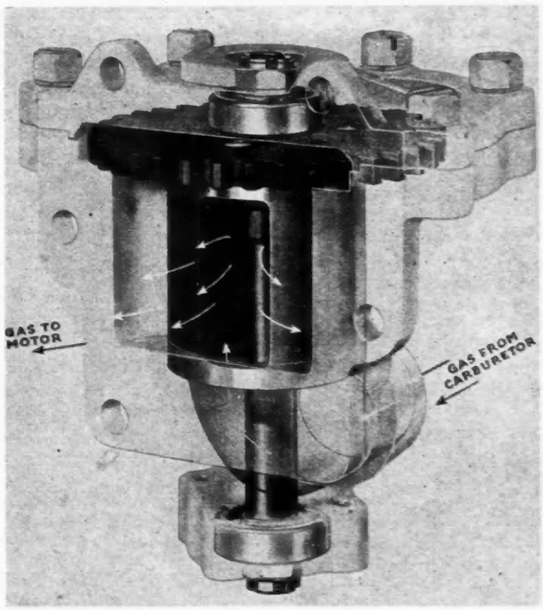
Chrysler is offering two sizes, the "Royal" and "Imperial," used as standard equipment in the Chris-Craft Cadet, Dodge Water Car, Dart Junior Runabout and Corsair Cruiser. The Imperial develops 108 hp. at 2900 and the Royal 87 hp. at the same speed.

Buda is now in the marine field with a Diesel engine of the four-stroke cycle, solid injection type following closely the M.A.N. Diesels developed in Germany. The model at the show had four cylinders of 6-in. bore. The stroke is 8 in. and the weight 3600 lb. This engine, which is a development of the Buda industrial-type engine which has been on the market for about six months, is rated at 94 hp. at 900 r.p.m., but is capable of developing 100 hp. at 1000. Maximum cylinder pressure is 375 lb., fuel injection pressure 3500 lb. Starting is accomplished by using two large 24-volt motors. No separate compressor is required.

Buda also has ready a similar engine of 6½-in. bore and 8¾-in. stroke, but with six cylinders, capable of developing 180 hp. at 1000 and weighing about 5600 lb. This model was not at the show. The weight of these engines is low as compared to most Diesel engines for similar heavy service, while the speed is relatively high.

Maybach is showing three types of engine suitable for marine service, all of them featuring the extensive use of aluminum alloys to decrease weight. One of these is a six-cylinder Diesel said to develop 150 hp. at 1300 r.p.m. and to weigh only 2200 lb. with aluminum crankcase.

The Morse double internal reverse gear with its straight-line drive is widely used and is a great improvement over the cumbersome types once common.



Rotary valve controlling admission to crankcase on Johnson engine

Wide Interchangeability *of* Parts *Effected* in Wright Engines

J-6 "Whirlwind" airplane powerplant now offered in five, seven and nine-cylinder sizes.

By A. F. Denham

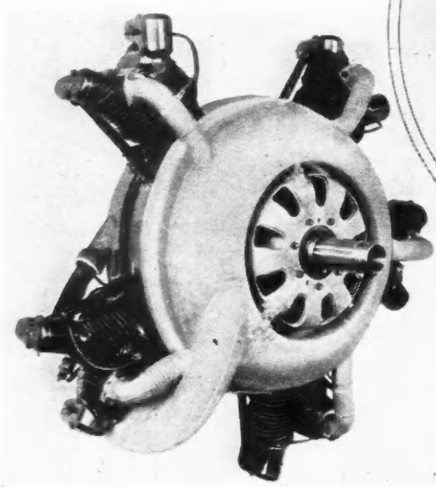
IN the Dec. 15 issue of *Automotive Industries* a preliminary announcement of the new series of three "Whirlwind" J-6 engines by the Wright Aeronautical Corp. was reported in connection with the Chicago Aircraft Show. Believing that some of the readers of this publication might desire further information regarding these engines, a summary is given here of the major features. Some interesting features of construction are not as yet available for publication for obvious manufacturing reasons, since it will be some months yet before the company will be in full scale production on these engines.

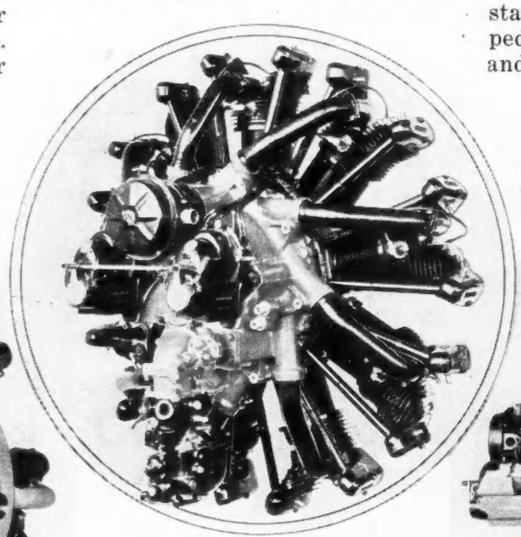
THE history of the development of the Wright "Whirlwind" engine since its first appearance. as the J-1, has been one of gradual increase in power and reduction in weight. To take the fullest advantage of this development the Wright Aeronautical Corp. has with the introduction of the J-6 decided to offer these engines in three sizes, a five, a seven and a nine-cylinder radial. On all three of these about 90 per cent of the parts, numerically, are interchangeable, these including complete cylinder assemblies, crankshafts, gears, connecting rods (except the master rod), pistons, valve gear (except cams), oil pumps, etc.

This development enables the production of engines ranging in power from 150 hp. for the five-cylinder, through 225 hp. for the seven, and to 300 hp. for the nine-cylinder, at a minimum manufacturing cost. Moreover, as published in these columns some months ago, considerable study has been given individual parts of the engine to reduce manufacturing costs of these parts. Thus connecting rods are now of I-beam section, rather than tubular, pistons are of the permanent mold type, using a single core, etc.

The effect of interchangeability on the service problem is also of considerable importance, reducing the stock of parts to be carried and facilitating procurement of such parts. The Wright corporation, moreover, is aggressively pushing at the present time the establishment of what is to be a nation-wide chain of service stations and dealers, fully equipped for the repair, maintenance and overhaul of all Wright engines.

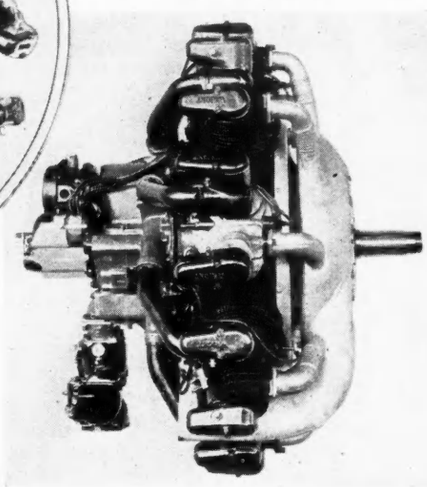
Below—Three-quarter front view of the five-cylinder Wright J-6, showing the central crankcase shutter cowling to regulate oil temperatures

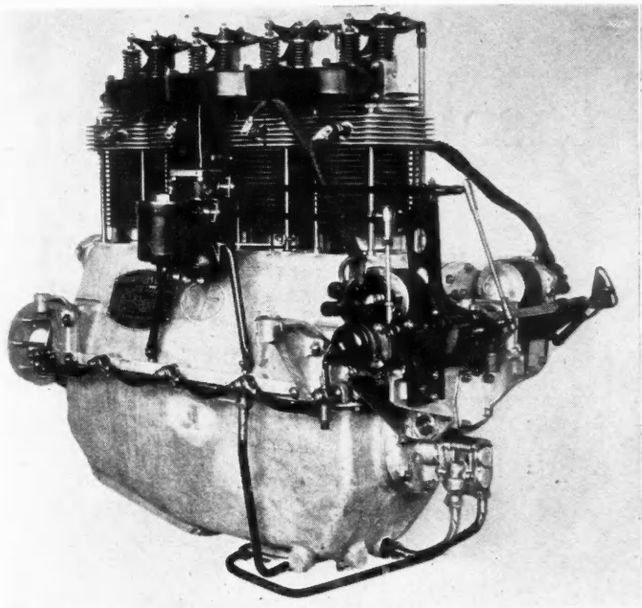




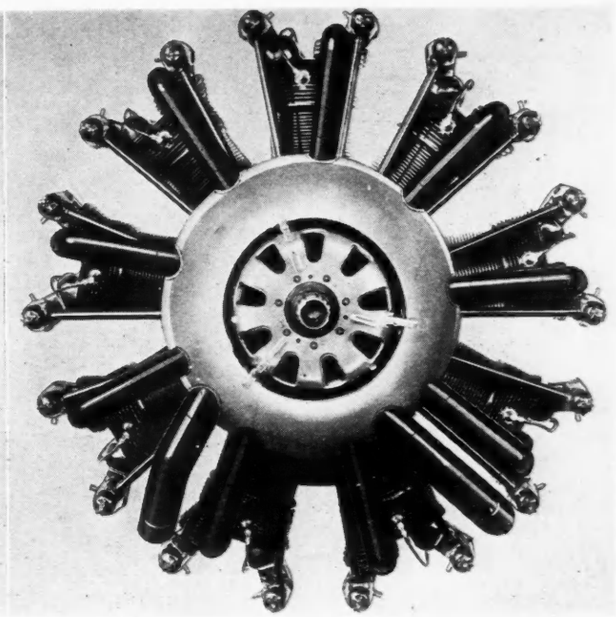
Above — Three-quarter rear view of the nine-cylinder J-6, showing grouping of all accessories at the back and the tangential inlet pipes from the rotary induction system

Below—Side view of the seven-cylinder J-6, showing the characteristic valve inclosure and exhaust collector ring





Three-quarter rear view of the Wright-DeHavilland Gipsy engine. Note the location of all accessories except the carburetor at the rear end



The Wright Cyclone is also equipped with a rotary induction system and shutter crankcase cowling within the exhaust collector ring

Of the general construction of the J-6 engines, the crankshaft is a solid forging, completely machined, counterweighted and counterbalanced. The master rod is of the split-type, its bearing on the crankpin being of a steel-backed metal containing approximately 20 per cent lead and 80 per cent copper. Link rods, as mentioned, are of I-beam section with bronze bushings pressed into either end. Pistons are special permanent-mold, cast-aluminum alloy of the trunk type, and carry three rings, all above the pin.

Valves are tulip-shaped, the exhaust valve having a hollow stem. Valve seats are shrunk-fit extruded bronze rings. Valve springs are helical, three concentric springs being used on each valve to raise the natural spring period out of the operating range. Valves are operated by rocker arms through push rods, inclosed, from hardened cam followers riding on the circular gear-driven cam within the crankcase. The latter is composed of four aluminum-alloy castings. The cam-follower rings, carrying the tappet guides, are cast integral with the main section for more rigid support and elimination of a number of detail parts. The rear section carries all accessories drives, including those for magnetos, oil and fuel pumps, generator and rotary induction system. The latter is composed of an aluminum impeller driven from the crankshaft, and serves not only to reduce the manifold vacuum, but also acts as a low pressure supercharger and fuel agitator.

Cylinders are steel barrels, with integrally-machined cooling fins, the barrel being screwed and shrunk into cast-aluminum-alloy heads, also finned for cooling, as usual. Cylinders are bolted to the crankcase, into which they are piloted. Intake ports are at the rear of the heads, leaving the exhaust ports at the front, where they are more easily cooled.

All three engines are provided with integrally-installed exhaust collector rings and shutter-type center cowling, operable from the pilot's compartment. Provision for generator and starter mounting is also made.

Following are major engine specifications:

	"Whirlwind" Five	"Whirlwind" Seven	"Whirlwind" Nine
No. of cyls.	5	7	9
Bore and stroke	5 x 5½ in.	5 x 5½ in.	5 x 5½ in.
Displacement	540 cu. in.	756 cu. in.	975 cu. in.
Compression ratio	5:1	5:1	5:1
Guaranteed hp.	150 at 1800 r.p.m.	225 at 2000 r.p.m.	300 at 2000 r.p.m.
Fuel consumption	.55 lb.	.55 lb.	.55 lb.
Overall length	40⅝ in.	40 23/32 in.	41 7/16 in.
Mount, flange to propeller hub	28 29/32 in.	28 29/32 in.	28 29/32 in.
Overall diameter	45 in.	45 in.	45 in.
Weight dry	370 lb.	425 lb.	485 lb.

In addition to these engines, the Wright line also includes the now fairly well-known "Cyclone" engine of 525 hp. and the new "Gipsy" engine, manufacturing rights for which have been acquired from the DeHavilland Co. in England. The engine will probably be manufactured at some other plant than the main one, located in Paterson, N. J. It is a four-cylinder-in-line air-cooled engine of 114 mm. bore, 128 mm. stroke, and developing 90 hp. at 1900 r.p.m.

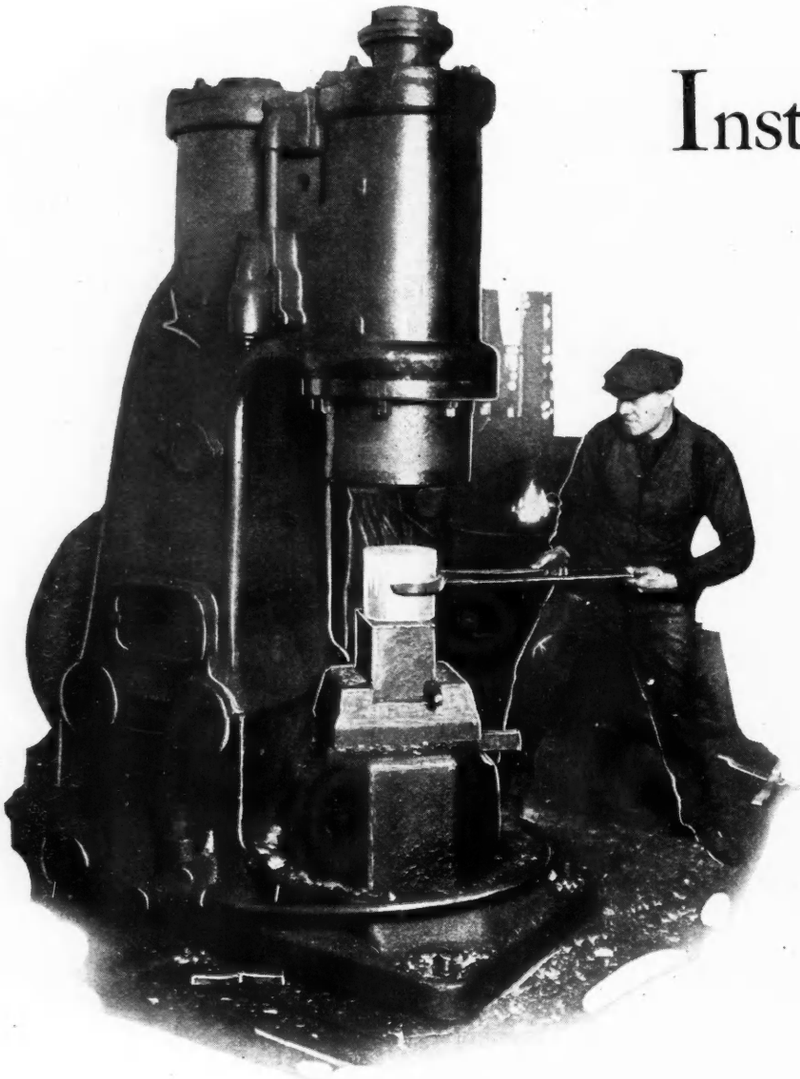
THE Metropolitan Body Co., Bridgeport, Conn., has developed a new front construction for motor truck cabs, whereby the strains on the glass and on the cab itself, due to frame distortion, are greatly reduced. The roof of the cab is arranged so it can slide laterally with respect to the windshield, being supported on the latter by means of telescoping tubes and a universal joint.

This is a feature of the Metro Duplex cab, one of the two types manufactured by the Metropolitan Body Co. The effect of the slidable, universal joint is said to be that it prevents glass breakage and prolongs the life of the cab.

Instalment Selling to Plant

Finance companies extending industrial machinery for

By H. Bertram Lewis



The transactions possible upon instalment terms range from the modernization of an entire plant down to the financing of a single machine

AN automobile manufacturer specifies for each of his dealers special service equipment costing from $299 up. A finance company prepares a plan for its financing and buys thousands of dollars' worth of dealers' notes thereunder—thus materially broadening the scope of its service to the automotive industry.

A manufacturer faced with the alternatives of wholesale modernization or eventual extinction, contemplates a $500,000 bond issue. Tedious negotiations develop an underwriting offer of 94 for the bonds, a 6 per cent interest rate for a 25-year term and, as a consideration for negotiating the loan, the transfer to the underwriters of 33 1/3 per cent of his common stock. The instalment terms of a finance company competent to handle business on that scale would have wound up the transaction within a three, four or five-year period, at a cost materially lower and on terms in every way more advantageous to the borrower.

The field of instalment financing is rapidly widening along industrial lines and the finance companies are thus developing a wholly new economic status. It is well within the possibilities that another decade may find them handling more equipment paper, such as that described above, than automobile or domestic utility paper.

Judging by the progress made to date in this respect, the rate of such evolution depends only on the ability of the finance companies to make the possibilities of their service clear to both the buyer and the seller of industrial equipment. The present need for modernization is so general throughout American industry that the field is undoubtedly tremendous. A recent industrial survey disclosed that 44 per cent of the machinery used in the metal working industry was 10 or more years old—in other words, completely out of date by present-day standards. All the evidence available tends to show that conditions in some other industries are even more backward.

W. H. Rastall, Chief of the Industrial Machinery Division of the U. S. Department of Commerce, commenting on this general situation writes:

> "Certain important manufacturers in this country refuse to buy equipment to modernize their plants unless it gives promise of paying for itself out of savings in from one to three to five years. The mere existence of such a policy implies that other and older plants are rendered obsolete with equal rapidity and yet the accounting heads of the business appear to disregard this situation, making no allowance for the obsolescence of capital assets when setting up costs applying to their products. Too often do we hear of 'exact costs' when obsolescence and certain other factors are completely disregarded."

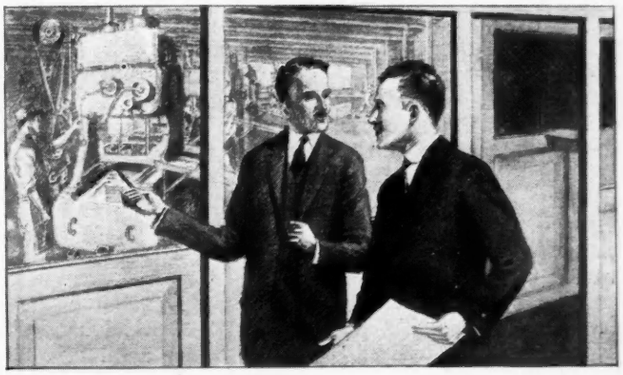
And with a constantly higher order of inventive genius among machinery manufacturers, the future rate of obsolescence seems to accelerate, and thus to guarantee an ever-recurring need for instalment terms, once their indispensability in this field has been established.

Writing, in the *American Machinist*, concerning the relation between low productive costs and up-to-date

Plan Spreading Equipment

operations to cover purchases of shops and factories.

Vice-President,
Commercial Credit Co.



THIS article deals with a subject that is of prime interest to all industrial organizations—the movement of the larger finance companies into the field of factory and shop equipment credit.

Under the plan which Mr. Lewis describes, production machinery may be purchased, for instance, by an automobile manufacturer on an instalment basis similar to that which has applied for years to retail purchases of motor vehicles and household appliances by the consuming public. The various advantages of finance company assistance in such cases are enumerated.

The author believes that this type of instalment business offers the finance company its greatest opportunity for future development.

equipment, T. C. Vail, superintendent, Spicer Mfg. Corp., supports Mr. Rastall's testimony by stating that five years is today the extreme limit for the life of the average machine tool. "I don't mean by this," he continues, "that the tool will be worn out, for it will probably have many more years of service in it, but I do mean that it will be obsolete and that it should therefore be replaced." And what with the many classes of interdependent operations for which mechanical improvements are continually being projected, any one of which may immediately render obsolete whole batteries of machines that were hitherto adequate, there can be very little question as to the soundness of his position.

From one day to the next there is no certainty that current methods in any department of the plant will not be utterly outmoded by the sudden introduction of some revolutionary principle or iconoclastic device.

Many New Fields Opened

And when one considers the multifarious equipment of the modern manufacturing plant and realizes how many different financing fields are opened by this entry of the finance companies into the industrial market the picture becomes even more impressive. Weighing devices, loading devices, material handling devices, hoists, cranes, pipe lines, bins, chutes, hoppers, power and heating equipment, fuel handling equipment, stokers, temperature control instruments, steam flow meters, compressors (steam and air), pumps, valves, tanks, ejectors, condensers, ash-removal devices, dehydration units, evaporators, filters, dryers, lathes, drills, presses, borers, grinders, milling machines, welding plants, fire protective devices, lighting systems—the complete list would include every mechanical assembly or unit of sufficient price to justify instalment merchandising. And the transactions possible upon instalment terms would range from the installation or modernization of an entire plant, in the case of a purchaser of high responsibility, down to the financing of a single machine, priced in the low hundreds, in behalf of a small-town machine shop or garage.

Of course, this new field of credit involves new credit problems and demands a wholly different basis of credit appraisal from that prevailing in the automobile or retail domestic utility field.

Industrial equipment is not readily repossessable, nor readily salable if repossessed. Unless its selection is soundly made the anticipated savings or increase of earnings will not be realized. And unless selected with forethought and an expert knowledge of productive conditions in the specific field to which it is applied, and of engineering trends in general, its rate of obsolescence may be unexpectedly rapid—with a proportionately rapid depreciation of the asset on which the advance is made. In such transactions, therefore, either the buyer's responsibility must be sufficient in itself to justify the loan or a responsible seller must accept the liability, and in either case engineering counsel must be sought in connection with all large installations.

The great advantage to the finance company from good paper in this class is the fact that, for the acquisition cost of a single large transaction, it is possible to keep a considerable sum outstanding, and therefore earning profits for a period of years. The chief hazard, of course, is the fact that heavy individual advances present concentrated risks. The spread, which makes automobile paper so exceptionally safe, is lacking. If, therefore, its selection pans out well the company makes more money; if ill, it takes uncomfortable losses. The approach is thus necessarily more cautious. But on the basis of experience to date it is safe to say that a thoroughly sound credit technique is achievable and that industrial paper, wisely bought, is in every way desirable.

There is, perhaps, no such thing as a standard basis for industrial financing. The products and conditions vary so that each factory contract and each individual

deal must have special consideration. As an approach to such negotiations, however, it may be said that 25 per cent is the average down-payment required, and 36 months the term of the average note—though some will run well beyond that limit.

Naturally the extent of the seller's liability and the degree of responsibility his participation, if any, represents, is a factor in the rate, since a certain proportion of every finance company rate represents a loss reserve and is increased or decreased according to the estimated risk. Other features of the plan are also varied to meet individual cases.

But whatever the details the service of the finance companies to industry has certain distinct advantages over any other basis of credit ordinarily available. It enables the seller to make attractive terms without tying up his own working capital during the process of liquidation.

It permits the buyer to acquire needed equipment and to apply its savings or increased earnings to the purchase price, instead of waiting until the price has been saved in advance—as in the case of a small machine shop or garage—or until the long-drawn-out negotiations for a stock or bond issue can be concluded, as in the case of a medium-sized manufacturing plant.

Orderly Amortization

It provides for orderly amortization, and, by a stipulated schedule of obligatory payments, insures cancellation of the debt within what should be the period of the new equipment's useful life.

It costs less than any other method of financing ordinarily available to either class of borrower. It is not, of course, cheaper than a cash transaction for one who has the cash. But for either a small shop or a moderately large one whose cash capital or bank borrowing capacity cannot encompass the transaction it is quite the cheapest method within the writer's knowledge of acquiring needed new equipment. And the obligation it sets up is not a millstone tied about the borrower's neck for years after obsolescence has overtaken the fixtures or machines it represents. Payments end—and interest with them—in time to leave the decks all clear for new financing when the progress of the industry necessitates another renovation of the plant.

Therefore, from the standpoint either of expediency or of economic merit, the time-payment principle and the service offered by the finance companies in applying it to industry seem to meet a serious need of the moment for a large industrial class.

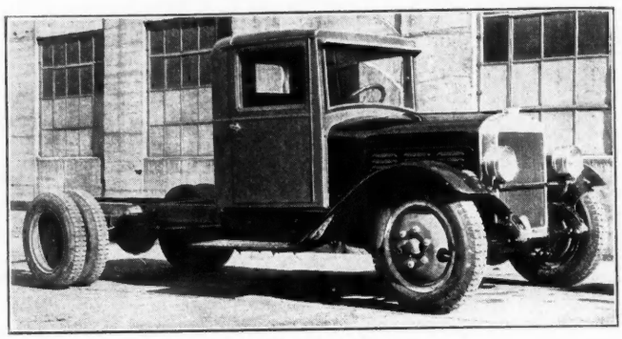
And if the observable auguries are dependable its use within that field will spread as rapidly as the story of its advantages can be circulated.

LeBlond-Schacht Truck

THE practice of the N.A.C.C. of publishing annually introduced by the LeBlond-Schacht Truck Co. of Cincinnati, embodies such features as a Continental six-cylinder, 70 hp. truck engine, a four-speed transmission, a Timken full-floating rear axle, Lockheed four-wheel hydraulic brakes, Spicer universal joints and the Ross cam-and-lever steering gear.

The standard wheelbase is 160 in. and a wheelbase of 174 in. is offered as an option. Equipped with 32 by 6 pneumatic tires, duals in the rear, but without cab, the chassis weighs 4075 lb., while with a coupe cab it weighs 4500 lb.

A Zenith carburetor is fitted and fuel is supplied to it by a pump. Ignition is by the Delco-Remy battery system. The radiator has a copper fin and flat tube core which is said to be practically burst-proof in case of a freeze-up. The shell is in one piece and is chromium-plated. An 18-in. fan is mounted back of the radiator which latter is mounted on rubber pads.



Series 20 LeBlond-Schacht truck

The clutch is of the multiple-disk type and the transmission is of Brown-Lipe make. Its low gear gives a very large reduction, 5.35 to 1. Back of the transmission there is a hand-operated emergency brake. All springs are semi-elliptic and of alloy steel. Front springs are 40 by 2½ in. and contain nine leaves, while rear springs are 50 by 3 in. and contain 11 leaves. The spring eyes are fitted with bronze bushings.

The frame is of pressed-steel, hot-riveted, and has four cross-members. The maximum depth of the side rails is 6 in., flanges are 3 in. wide and ¼-in. stock is used. All holes in the frame are jig-drilled and all frame brackets are machined. The fuel tank under the seat has a capacity of 18 gal.

Following is a list of the items of equipment furnished with the truck: Electric headlights and taillight, electric starter, Delco-Remy generator, Exide 6-volt battery, oil filter, air cleaner, fuel pump, chromium-plated bumper, speedometer, oil gage, ammeter, horn, jack, and complete set of tools.

German Automobile Industry

THE practice of the N.A.C.C. of publishing annually important statistical material in relation to automobile production and commerce in its Facts and Figures has had widespread emulation in European countries and similar publications are now issued in England, Germany, France and Italy, although the French edition is not an official one by the representative organization of the automobile industry but is published by a tire manufacturer. The German Automobile Manufacturers Association's annual Tatsachen und Zahlen aus der Kraftfahrzeug-industrie for 1928 has made its appearance recently and is full of interesting data. It is rather unfortunate, however, that the compilation, which covers production during the business year 1927, made its appearance so late in the year.

The total number of motor vehicles produced in Germany in 1927 was 125,000, of which 84,610 were passenger cars, 11,091 trucks and delivery wagons, 881 motor buses, 10,114 special vehicles (fire engines, sprinkling carts, etc.) and 18,472 chassis. In addition 84,000 motorcycles were produced. These production figures show a rapid growth of the German industry since the lifting of the embargo in 1924. The number of people employed in the German automobile industry increased from 62,641 on Jan. 1, 1927, to 88,935 on Oct. 1, 1927.

Just Among Ourselves

New Uses Still Found for Chrome Plating

WHEN Oldsmobile first introduced chrome plating for finish of radiator shells and lamp rims, the possibilities of this type of finish were considered with much interest by the automotive industry as a whole. When last year and during the summer months chrome plating became practically as universal for exterior bright work finish as lacquer for body colors, some felt that the limits of its usefulness had been reached. But the New York show brought still further applications to notice. Peerless uses it for finishing all hardware in the front compartment, and Jordan has chrome-plated wire wheels as standard equipment. The latter is an especially significant commentary on the ability of the industry's electro-chemists. A few years ago production plating of such complicated parts as wire wheels was considered as next to impossible on anything like a reasonable cost basis.

* * *

Try This One on the Slide-Rule

IT has been usual to figure that if our industry is capable of producing 7,000,000 vehicles a year and actually does produce only 4,750,000, we must have an overcapacity of 2,250,000. One of our office statistical experts proved to us the other day that such figuring is all wrong. Here's how: To fill present demand the vehicle factories must be equipped to produce 462,000 vehicles in one month because August, 1928, resulted in such a production. Regardless of the fact that such production is not required *every* month to meet present demand, capacity for such production is needed because the demand is that high in some months. That means that the industry must have a capacity of about 5,925,000 vehicles in order to meet the demand for 4,750,000 vehicles a year which exists at present, owing to the seasonal character of the demand. Figuring on that basis then, the only real overcapacity of the industry lies in that area between 7,000,000 and 5,925,000, thus making our overcapacity at present something like 1,075,000 instead of 2,250,000 as previously believed. There may be a catch in it, but it sounds logical to us. Figure it out for yourself.

* * *

Chicago Provides Good Show Weather

CHICAGO turned out some good, clear weather for the automotive men who went to the opening days of the show this year. The temperature was plenty low enough, to be sure, but those whose stint involved trooping about from one hotel to another in search of friends, information or conviviality appreciated the clear skies no end.

* * *

Dealer Contacts Insure Good Season

AFTER good January sales by most makers, the dealer contacts made at the Chicago show can be counted on to have a particularly stimulating effect on merchandising activities for the next few months. Attendance of retailers at the various show-week gatherings in Chicago was as good or better than last year and a good selling season can be forecast without much qualification. Viewing the dealer interest from an opposite angle, that interest can usually be interpreted as a sign of healthy business conditions.

* * *

Heavy Attendance of Wholesalers

AS in New York, the Chicago show had an exceptionally fine shop equipment exhibit fully up to what might be expected in view of the vastly increased importance of service and maintenance work to the industry as a whole. Motor & Equipment Association had charge of this as well as the other parts and accessory phases of the show. During the week hundreds of wholesalers and their salesmen were in attendance at the show, meeting their customers, demonstrating equipment and booking orders. A good volume of business was indicated from results of the opening days.

* * *

Home Life Has Its Risks

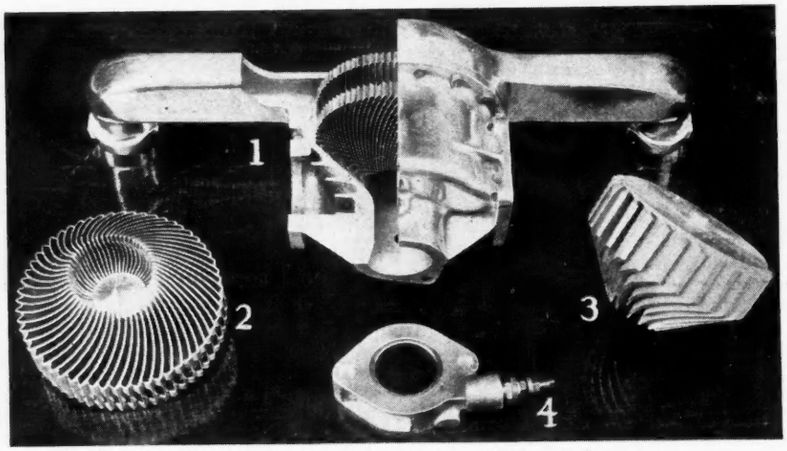
READ a note somewhere the other day stating that one insurance company in this wide land of ours last year paid 6000 accident claims to policyholders who were injured in their own homes and only about 6900 claims to those who were injured in or by automobiles. We always were suspicious of this companionate marriage business.—N.G.S.

Few *Changes* Necessary *to* Convert Buses for Oil Fuel

System worked out by P. R. T. calls for no engine alteration except that oil-burning assembly is bolted to cylinder block in place of usual standard intake pipe.

By James W. Cottrell

THE substantial reduction in fuel cost which could be effected by burning fuel oil in place of gasoline in motor vehicles has inspired many engineers to seek means of overcoming difficulties standing in the way of general adoption of the cheaper fuel. The Diesel principle has been used for some time in stationary and marine powerplants and more recently high-speed Diesels have been designed for truck service. Attempts have also been made to carburate the oil and burn it in gasoline engines.



Godward gas generator and intake manifold. Exhaust gas enters at the left (1) impinging on the fins. Vaporizing plates for gasoline passenger cars are shown at left (2) and for buses at right (3). Electric heating ring for starting on fuel oil is shown at (4)

Development of equipment for burning fuel oil in engines of Philadelphia Rapid Transit gas-electric buses, by means of a standard carburetor and a gas generator, was announced in the news section of *Automotive Industries* last week. The equipment was described to engineers and visiting bus owners by J. A. Queeney, vice-president of operation of Mitten Management, Inc. He stated that 20 buses are now operating regularly on fuel oil and the entire fleet of 580 buses will be so operated during this year. A more complete description of the fuel oil burning equipment and results of tests of buses in which it is incorporated can be given at this time. Information here given is based upon Mr. Queeney's paper read before the Engineers' Club and subsequent explanation in the company's research department.

No structural changes are made in the engines and the fuel oil burning assembly is bolted to the cylinder block in place of a standard intake pipe, the standard carburetor being attached to the assembly in approximately the same position.

Mixture coming from the carburetor enters the gas generator and is converted into a dry gas. The generator consists of an aluminum pot in which a nest of stationary curved plates, radiating from a central core, is set. Lower edges of the plates are in contact with the inner surface of the aluminum pot which is jacketed and heated by exhaust of the engine. A circular plate covers part of the top of the plates leaving a ring-shaped opening through which gas passes.

Passages for the mixture are much larger than an ordinary intake manifold and gas velocity consequently is reduced. The curved plate surfaces provide a relatively large area, about 1000 sq. in., upon which the mixture impinges and liquid particles are evaporated.

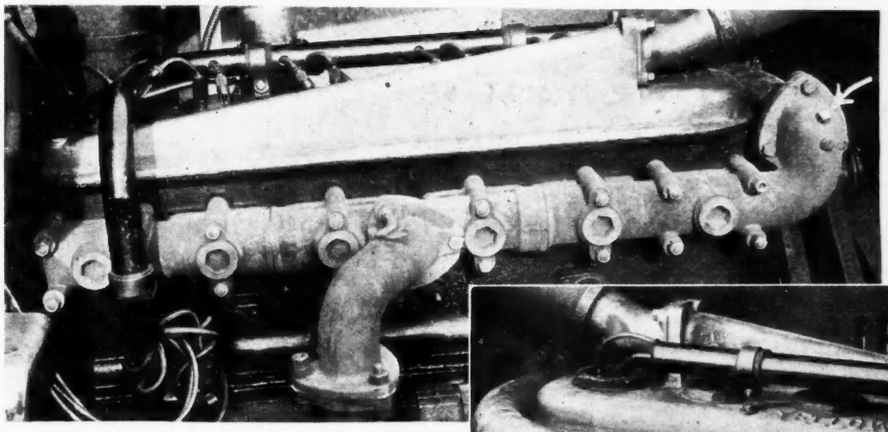
A temperature gradient is set up in the generator, due to shape of the parts and the directed flow of exhaust gas. The bottom of the pot is hot and the temperature gradually decreases toward the top. Fuel particles which are not converted into gas on entering the generator are deposited upon the heated plate surfaces where they spread outward and downward until evaporated.

In connection with the device a special intake manifold is used. This manifold is free of sharp bends, pockets or hot spots and it has considerably greater cross-sectional area than a conventional manifold.

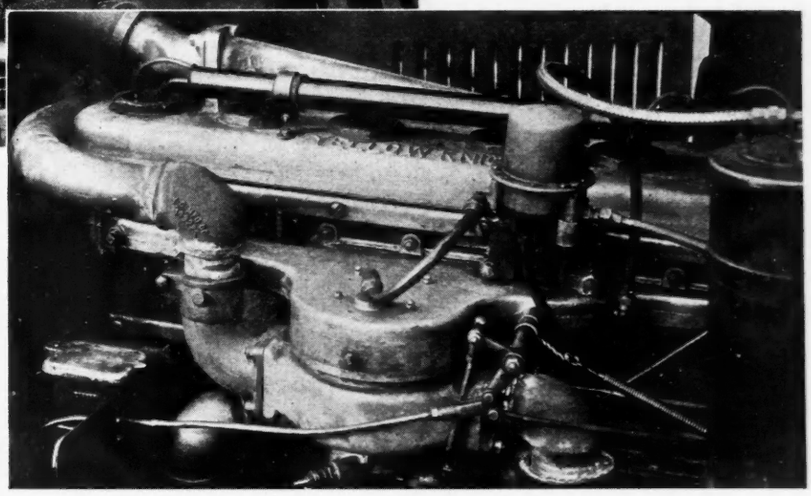
Electrical Heat for Starting

To permit starting on fuel oil an electrically heated ring is incorporated in the riser above the carburetor. This unit draws current from the storage battery at the rate of 80 amp. at 12 volts for about one minute, after which the engine may be started in the usual manner.

This type of generator, which was developed by Godward Gas Generator, Inc., New York City, to improve carburetion of passenger car engines using gasoline, was offered for trial to Philadelphia Rapid Transit Co. two years ago. Engineers of the latter company were working on the fuel oil problem and they conducted experiments with the Godward device using this fuel.



Left—Exhaust is carried around front of the engine to fuel oil burning equipment. Tap for exhaust gas analysis is indicated by arrow



Right—Fuel oil burning equipment on P.R.T. gas-electric bus. The pipe and small tank above the intake manifold are parts of the lubrication system

Engineers of the two companies then joined in studying the problem and finally adopted the present design.

An instrument which indicates and records percentage of unburned fuel in the exhaust of an engine under test has been developed by Mitten Management. The apparatus consists of two small cylinders each containing a wire. These wires are connected to a battery and a moving coil galvanometer. Exhaust gas and air is introduced into one cylinder and the combustible gas is ignited when it contacts the heated wire. Burning of the gas raises the temperature of the wire and the resulting change in resistance is read off as percentage of unburned fuel in the exhaust. A series of analyses of exhaust gas samples was made to establish the relationship of percentage of unburned fuel and of carbon monoxide. This has been plotted on a table so that percentage of CO can be determined readily from the total figure shown on the instrument.

Tests were made by Professors Authenreith and Baum of College of City of New York of operation and of exhaust gas of buses equipped with fuel oil burning equipment. Extracts from their report follow:

The engine was operated on 42 Baume fuel oil, specific gravity 0.814, and the power unit delivered as much as 47.5 kw. at 1600 r.p.m. Exhaust gas analysis was:

	Percentage		
	CO_2	O_2	CO
1600 r.p.m., full throttle	12.6	.3	2.5
	12.6	.2	2.4
Idling, 380 r.p.m.	9.7	7.0	0.0
	10.4	5,6	0.0

Jets during these tests were, venturi 33, main jet 29, compensating jet 28, idling jet 40 with needle valve seat enlarged ⅛ in. diameter. Two different idling needle valve setting were used during idling tests.

Operating on gasoline and without the fuel oil burning equipment the results were:

	Percentage		
	CO_2	O_2	CO
Full throttle, 1600 r.p.m.	12.2	0.5	3.1
Idling, 380 r.p.m.	6.4	4.4	7.3

Reporting upon performance they say, "The engine was started on this fuel (fuel oil) and ran very well with ample power and acceleration for all conditions of traffic and grades encountered. The operation of the engine could not be distinguished from that of similar buses on the street running on gasoline. From the various runs made under different conditions described we are convinced that it is practicable to operate your buses on either gasoline or fuel oil with the Godward equipment and Zenith carburetor and secure a carbon monoxide content of the exhaust gases of less than 3 per cent under your conditions of operation."

The effect which burning fuel oil has upon performance, economy, maintenance and crankcase dilution was related by Mr. Queeney. He reported that performance of the engine operating on this fuel compares very favorably with the performance secured through the use of gasoline. Idling speed, acceleration and power, all so essential to good operation, are attained through this device, with a fixed carburetor setting.

The economy in quarts per kw.-hr. with fuel oil is 5½ per cent better than with gasoline, with the same carburetor setting. The economy effected due to the difference in the cost of fuel oil and gasoline is about 29 per cent.

Close attention has been given to the effect of the use of fuel oil on the maintenance of the engine. After over 250,000 miles of operation nothing was found that indicates in any way any additional wear or any change whatsoever in the condition of the engine as the result of using fuel oil. These buses are on the same maintenance schedule as those using gasoline.

When using fuel oil the dilution is no greater than when gasoline is used with standard equipment without the Godward device.

Considerable trouble with smoke occurred at first with fuel oil, particularly when the engine was idling. This trouble was remedied by the simple expedient of removing the throttle valve from the conventional location in the carburetor below the gas generator to a point where the mixture enters the intake manifold.

Estimates Show *Steady* Increase in *British* Production

Output of passenger cars and commercial vehicles placed at 209,000 in 1927. Gains in efficiency indicated by higher per man production and value.

THE Statistical Department of the British Society of Motor Manufacturers and Traders has published information on several aspects of automobile production in Great Britain of late years.

Of the Table I given below, relating to the output of passenger cars and trucks, it is stated that the figures are estimated on the basis of the Census of Production of 1907, registration statistics and those of import and export, supplemented by information received officially and otherwise.

It is added that since the first publication of the table in the 1926 edition of the Society's book on the motor industry of Great Britain, the preliminary results of the Census of 1912 and 1924 have appeared, and that, when due allowance is made for foreign assemblies and differences of classification, the Census figures confirm the estimates for those years. The estimate for 1924 and former years having been corroborated so closely that no adjustment has been found necessary, it is considered that the figures for subsequent years on the same basis may be relied upon. Nevertheless, it must be noted that the figures for 1925, 1926 and 1927 are estimated, for British manufacturers in general still refuse to give particulars of their individual outputs, even to the Statistical Department of their own Society. The Government Census of Production, it should be mentioned, is taken at periods of five years, and, as the foregoing infers, the results are not issued until they are much behind the times. In all the following tables "Commercial Vehicles" include trucks, buses, coaches, fire engines, etc.

Table I

Output of Passenger Cars and Commercial Vehicles

	Cars	Commercial Vehicles	Total
1907			12,000
1908			10,500
1909			11,000
1910			14,000
1911			19,000
1912			22,000
1913			44,000
1922			73,000
1923	66,396	21,604	88,000
1924	105,468	26,532	132,000
1925	121,000	32,000	153,000
1926	138,500	41,500	180,000
1927	157,000	52,000	209,000

In view of the fact that the foregoing table represents estimated production, it is of interest to note the figures arrived at by M. W. Bourdon, the British correspondent of *Automotive Industries* and the *Motor Trader* (London) respectively concerning passenger car output, also mainly or partially by estimates taking into account official and unofficial information, registration statistics, imports and exports, etc. The following table brings the three estimates for 1924-27 into direct comparison; the differences can probably be accounted for to a large extent by methods of computation, notably with respect to the proportion of scrapped vehicles, foreign assemblies and classification of imports, for on none of these points are definite official statistics available.

Table II

Comparison of Estimates of Production Passenger Cars Estimated by

Year	S. M. M. T.	M. W. Bourdon	Motor Trader
1924	105,468	97,000	107,000
1925	121,000	131,000	133,500
1926	138,500	155,000	158,700
1927	157,000	163,500	161,900

From an analysis of returns made to the Society by British manufacturers, it would appear that the number of motor vehicles produced per man employed in passenger car and commercial vehicle factories, respectively, per year, and the average selling value produced per man-year, have been as follows:

Table III

Labor Output—Motor Vehicles

	Output Per Man-Year Private Cars	Output Per Man-Year Commercial Vehicles	Output Value Per Man-Year Private Cars	Output Value Per Man-Year Commercial Vehicles
1924	1.99	.55	£600.9	£545.3
1925	2.49	.79	666.2	586.6
1926	2.54	.90	652.5	598.8
1927	2.81	.95	666.3	642.3

In accessory and component factories employment, wages, and net value of sales have gone up in very similar ratio during the four years in review. This can be seen below, together with the value of output per man employed, which also shows steady increase. The index for 1924 equals 100.

Table IV

Labor Output—Accessories

	Employment	Wages	Net Value of Sales	Value of Output Per Man-Year
1924	100.0	100.0	100.0	£398.7
1925	111.1	117.1	117.8	422.8
1926	119.7	128.8	124.7	415.4
1927	133.9	146.6	144.8	431.0

The figures relating both to employment and to wages show increases. The employment totals refer to all those directly employed in the construction and repair of motor vehicles (but not motorcycles), and of parts, accessories, and tires.

Table V
Employment Totals

Year	Number Employed
1907	34,000
1911	66,000
1921	159,000
1923	194,000
1924	219,000
1925	235,000
1926	241,000
1927	257,000

Employment and wages were adversely affected in 1926 by the general and coal strikes. The average earnings of all skilled and unskilled men have been as follows:

Table VI
Average Earnings Per Employee Per Week

Year	s.	d.
1914	40	8
1923	71	10
1924	75	5
1925	78	3
1926	76	4
1927	80	7

The products of the industry have been consistently reduced in price in recent years. In Table VII index figures of the fluctuations in list prices of 12 typical models each of private cars and commercial vehicles are compared with the cost of living index.

In Table VIII the private car and commercial vehicle index figures are corrected by the application of the cost of living index. On a gold basis (i. e., in pre-war money) current prices of private cars and commercial vehicles are 50.1 per cent and 38 per cent respectively below the pre-war level. 1928 includes the first six months.

Table VII
Index of Nominal Prices

	Private Car Prices	Commercial Vehicle Prices	Index of Cost of Living
1914	100.0	100.0	100.0
1922	135.5	126.2	181.4
1923	116.5	117.7	173.6
1924	99.1	108.9	175.0
1925	98.2	107.6	175.1
1926	92.2	104.2	172.0
1927	88.4	104.2	167.0
1928	82.1	102.0	164.4

Table VIII
Index of Gold Prices

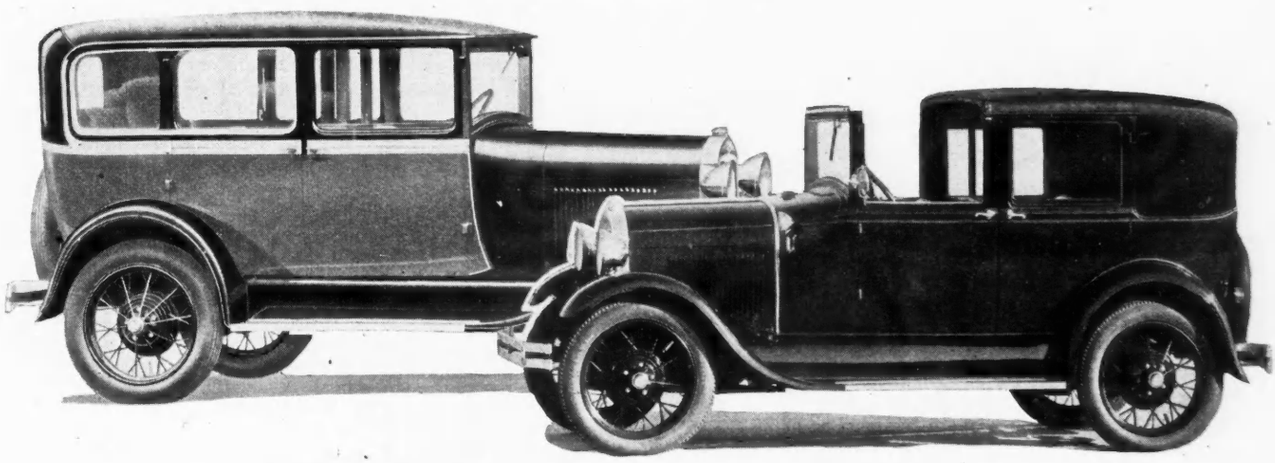
	Private Car Prices	Commercial Vehicle Prices
1914	100.0	100.0
1922	74.8	69.7
1923	67.1	67.8
1924	56.6	62.2
1925	56.1	61.4
1926	53.6	60.6
1927	53.0	62.4
1928	49.9	62.0

The industrial dislocation of 1926 increased the cost of production and of materials. A comparison of the first two columns of Table VII with the fluctuations in Table IX of wholesale prices of materials and the earnings of work people in the motor trade is considered a tribute to the increased efficiency of the British motor industry.

Table IX
Material Prices and Earnings

	Index of Whole Prices of Materials	Index of Earnings in Motor Industry
1914	100	100.0
1922	155	...
1923	161	176.4
1924	166	185.3
1925	155	192.2
1926	144	187.6
1927	135	197.9
1928	135	183.5

Two New Models Recently Added to Ford Line



TWO new models recently added to the Ford Model A line are shown here. The taxicab (left) was placed in production several weeks ago and sells for $800. It seats four passengers. The other model, the town car, is a chauffeur-driven job and lists at $1,400

Aircraft Propeller Hub Standards Adopted by S. A. E.

Four sizes approved at recent Standards Committee meeting. Recommended practice in power take-offs is amended. New tail-light specifications in effect.

By P. M. Heldt

THIRTEEN divisions presented reports at the Standard Committee meeting of the S.A.E. held recently under the chairmanship of A. J. Scaife of White Motor Co., and practically all were adopted as presented. What is regarded as one of the most important is one for aircraft propeller hubs and shaft ends, in which some "last-minute" changes were made by the division. The standard includes four sizes, with nominal shaft diameters over the splines of 2, 2⅜, 2⅝ and 3⅛ in.

The Agricultural Power Equipment Division recommended that the S.A.E. Recommended Practice on Power Take-offs be amended by adding details of the spline fitting and sizes of shafts as standardized by the Society of Agricultural Engineers. Two sizes of shaft are standardized, both with S.A.E. 6-B spline fittings, a 1⅛-in. shaft for engines up to 20 hp. and a 1⅜-in. shaft for engines up to 40 hp. These ratings are based on the use of material having a minimum torsional yield point of 65,000 lb. p. sq. in. The straight length of the spline is to be 3 in. and retaining means for the fitting are to project not more than 1 in. from the end of the spline. The normal speed of the power take-off shaft is to be 536 r.p.m., plus and minus 20, and the direction of rotation is to be clockwise facing in the direction the tractor travels. This recommendation was accepted.

The Axle and Wheels Division had made a canvass to determine the extent of use of the S.A.E. front axle hub specification, and found that only one passenger car and two truck manufacturers follow these specifications, in consequence of which it was decided at the meeting to cancel them.

A recommendation of the Electric Vehicle Division to change the rating of the smaller standard charging plug from 50 to 100 amp., to bring the standard into accord with present practice, was approved.

Electrical Proposals Approved

All proposals of the Electrical Equipment Division were approved. These included the cancellation of starter mounting No. 3 and a slight modification in starter mounting No. 2; the adoption of a timer-distributor hold-down arm and screw, as an addition to the passenger-car type standard timer-distributor mountings; the adoption of a new table of sizes of rubber bushings, eliminating many sizes not used, and the adoption of two additional generator mountings, for use with adapter type flanges. These latter permit of the use of two-bolt flanges and other types where necessary, while still leaving the generators interchangeable.

All recommendations of the Lighting Division were likewise accepted. These included the cancellation of the present tail-light specification and adoption of a new set of specifications governing acceptability of such lamps; adoption of a list of stock sizes of headlight lenses, cancellation of the present specification for signal lights, adoption of a revision in the present universal headlight mounting, cancellation of all other types of headlight mountings and amendment of the specifications of the universal type to read: "All headlights shall be mounted so that their centers are not less than 32 in. nor more than 42 in. from the ground, the preferred height being 36 in. Means shall be provided for aiming the beam straight ahead, with the upper cut-off horizontal, and to permit vertical adjustment over limits of 3 deg. above and below the horizontal." In the drawing of the universal mounting the spherical surface of the mounting is now specified as of "2.500 spherical radius to gage."

Prediluted Oil Numbers

At the Standards Committee meeting last summer the recommendation of the Lubricants Division to classify prediluted oils by the viscosity numbers of the undiluted oils met with considerable opposition and the matter was referred back to the division but at this meeting the following slightly modified recommendations passed without opposition:

"In the case of prediluted oils, S.A.E. viscosity numbers by which the oils are classified shall be determined by the viscosity of the undiluted oils.

"Wherever the S.A.E. viscosity numbers are used on prediluted oils, the container labels should show in some suitable manner that the S.A.E. number applies to the undiluted oil."

The Motorboat Division submitted drawings and tables of dimensions for propeller shaft couplings, propeller hub bores and propeller shaft ends, the two former as proposed Recommended Practices and the latter as a proposed Standard. Marine engine couplings were standardized by the S.A.E. some years ago, but the standard did not meet the requirements of practice and was later cancelled. Practice in propeller hub bores is very nearly uniform and the proposal is in accordance with current practice, so it was accepted without opposition. There is no uniformity of practice in regard to propeller shaft couplings and the proposed couplings differ in some respect from current practice. While most couplings now in use have straight bores, it was decided to recommend taper bores, as more in harmony with general automotive practice. It was also decided to recommend the use of the same taper at both ends of a shaft, to make it possible to turn the shaft end for end when one portion has become worn, thus doub-

ling the life of the shaft. Since propeller bores have a taper of ¾ in. per ft., this fixed the taper for the couplings. It was also decided to specify a fine thread for the shaft ends, which is more suitable than the coarse thread now commonly used, for the reason that a cotter pin must be used for locking the nut.

Drawings with complete dimensions were submitted of four reverse gear coupling flanges and propeller shaft couplings. Arthur Nutt of the Curtiss Aeroplane & Engine Co. objected to this proposal and said only the fitting or joint dimensions should be standardized and all other dimensions left to the judgment of the designer, and that the material specification given as "steel" did not mean anything. It was decided to eliminate the material specifications and all outside dimensions, and in this form the recommendation was adopted. The tables of marine propeller hub bores and shaft ends were also approved.

Specifications Cancelled

The Motor Truck Division recommended the cancellation of specifications regarding trailer hitch dimensions, and of the Recommended Practices on Motor Truck Bodies and Motor Truck Cabs, and it proposed the adoption as an S.A.E. Recommended Practice that "dump bodies of capacities greater than 1½ cu. yd. shall be hand-hoist or power-hoist operated." All recommendations were approved. The reason for the recommendation regarding dump bodies is that many truck frames are broken by the use of gravity dump bodies of large capacity.

The Passenger Car Division had prepared a complete revision of the present leaf spring specifications and recommended the cancellation of existing standards and specifications on leaf-spring nomenclature, leaf points, finish of springs, wrapped spring eyes, leaf-spring definitions, leaf-spring nibs and shrunk center bands, which latter two were said to be no longer used. A leaf-spring specification form is included in the proposed recommended practice. A new definition of rate (or flexibility) is proposed, viz.: one-half the force, in pounds, necessary to deflect the spring from 1 in. above its normal loaded position to 1 in. below that position. Four finishes of the steel plates are provided for, as follows:

Finish No. 1—Leaves shall be left in the same condition as that in which they come from the heat-treating process.

Finish No. 2—All burrs on the bearing sides of the leaves shall be removed.

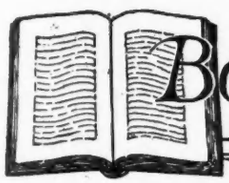
Finish No. 3—The sheared and trimmed edges of the leaves shall be chamfered on their bearing sides.

Finish No. 4—All loose scale shall be removed. Combinations of these numbers may be used to indicate the complete finish desired.

The specifications give dimensions and tolerances for spring plates which are to be of concave form and, when ordered to gage, to be to the Birmingham wire gage. Leaf spring tests also have been revised. The report was approved.

The Production Division submitted specifications for plain cylindrical ring gages, and the Screw Threads Division specifications and tables of dimensions for round unslotted-head carriage bolts, both reports being accepted.

The Transmission Division, in view of the gain in popularity in this country of four-speed transmissions for passenger cars, recommended that the standard gear positions for four-speed gears, which now apply to trucks only, be made to apply to passenger cars also, which was agreed to.



Books for the Business Bookshelf

Trade Associations — Their Legal Aspects

Benjamin S. Kirsh, Central Book Co., New York. 271 pp.

MUCH confusion still exists in the minds of many concerning the legal aspects of trade associations, particularly with reference to what group activities can be undertaken within the law. The present volume has been prepared in an attempt to clear up some of this confusion and to present an analysis of some of the more important problems encountered in carrying on trade association functions. Such subjects as uniform cost accounting, credit bureau functions, patent interchange, foreign trade functions, collective purchasing and standardization as carried on by trade associations are among the things discussed in the book which should be of practical value to those involved or interested in trade association activities.

Manufacturing

Malcolm Keir, The Ronald Press Co., New York. 611 pp. $5.

THIS book is the first of a series on Industries of America which is intended to give, in readable terms, a comprehensive view of American industrial development, particularly during the new industrial era which has arisen since the war. The present book does for the more important manufacturing industries what other volumes will do with single productive pursuits. Typical of how the book is written, the chapter on the automotive industry starts with brief histories of the leading automotive manufacturers, discusses the problems presented by developments in the use of trucks and buses, treats of the changes in manufacturing methods brought about by assembling of cars, standardization of parts and improvements in design; and finally presents information regarding marketing conditions and prospects. Other industries covered in this book include agriculture, power, iron and steel, leather, etc. It furnishes a very complete background of knowledge for analyzing our industrial development.

The Airplane and Its Engine

By Charles Hugh Chatfield and Charles Fayette Taylor; McGraw-Hill Book Co., Inc., New York. 329 pp. Illus.

THIS latest addition to the library of works on aviation strikes a medium between the technical and popular; it avoids the complexities that are useful and comprehensible only to the engineer or highly specialized mechanic, yet it is not superficial. The fundamentals of aerodynamics and of airplane engine design and operation are clearly set forth with the occasional aid of simple mathematics. Numerous photographs, charts and sectional drawings materially aid in the understanding of the text.

NEW DEVELOPMENTS—Automotive

Walcott De Vlieg Supermil

THE Walcott Machine Co., Jackson, Mich., has developed a new De Vlieg Supermil which is intended to provide a machine with true spindle rotation, smooth power, great rigidity, a continued true plane of travel for the work and uniform thickness of chip. Some of the features of this new machine are:

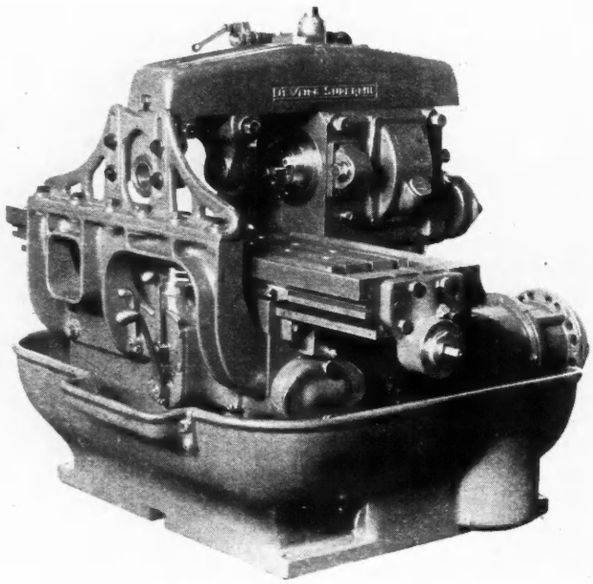


Fig. 1—Walcott De Vlieg Supermil

Hardened and ground tool steel table ways with automatic lubrication; a special form of feed screw with hardened, ground and lapped thread; provision for a new device for eliminating backlash which makes it possible to feed the work with and against the cutter, and to permit climb cutting as a regular method for all types of work in the range of the machine. Other features are automatic flood lubrication, Timken bearings, generous chip pan and coolant system, a truss type overarm, flange type motor drive, ground tooth gears and splined shafts.

The table is a heavy-ribbed casting 6 in. deep, while ways on the bed are of hardened tool steel ground accurately in position, and oiled under pressure from the central circulating system. A flange type motor, using standard 10-hp. rotor and stator parts and special end plates is standard. In addition to the motor the main drive unit consists of a multiple plate disk clutch for starting and stopping the main spindle, bevel gears for transferring the drive to the vertical shaft, a pinion for driving the feed and rapid traverse mechanism, and the drive for the lubricating pump.

The spindle is a hardened alloy steel forging and is ground all over. The nose construction is in accordance with the new N.M.T.B.A. standard. It is mounted on Timken bearings in a 7-in. diameter quill which provides 2-in. endwise adjustment, affected by a sensitive worm mechanism.

Pickoff gears provide a range of spindle speeds from 20 to 180 r.p.m., with higher speeds possible through special ratios. All shafts are mounted on anti-friction bearings and are submerged in oil. The vertical slide is a vee and flat construction with an interlocking gib. The overarm is truss type, with

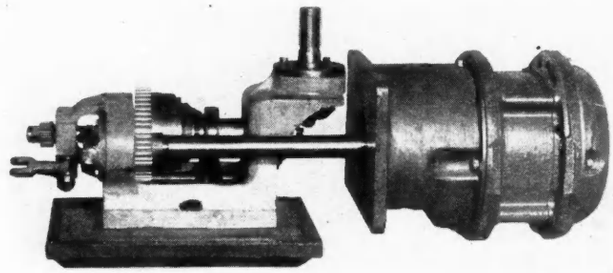


Fig. 3—Detail of self-contained drive unit

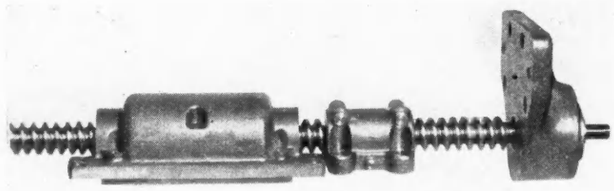


Fig. 4—Special form of feed screw used is 2 in. in diameter and has a 5/16-in. bearing on each side

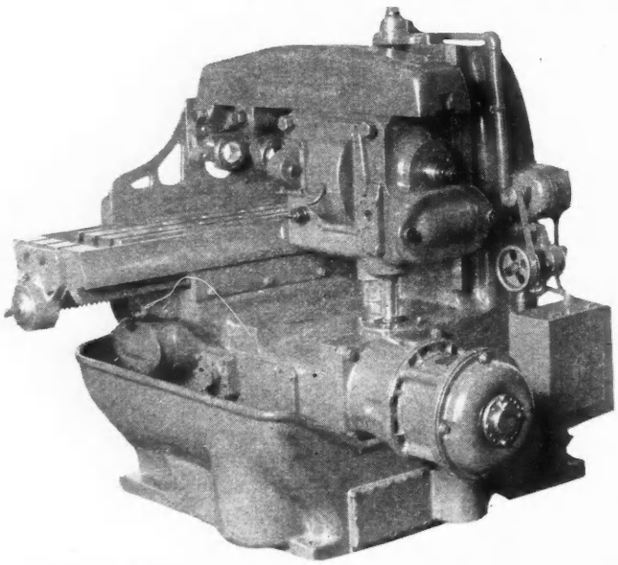


Fig. 2—Rear view of Supermil showing flange-type motor

alignment obtained on a vee section in the center supported by narrow flats at the extreme edges.

The feed, rapid traverse and their control mechanism are built in a separate unit. This provides a power speed with a range from 1.8 in. to 21 in. per minute in either direction and a power rapid traverse motion of 180 in. per minute in either direction. The unit is protected by a multiple disk slip clutch under spring tension which provides ample power for ordinary operation but will yield should the operator

Parts, Accessories and Production Tools

run the table into an obstruction. A takeoff from this unit provides power for the feed unit.

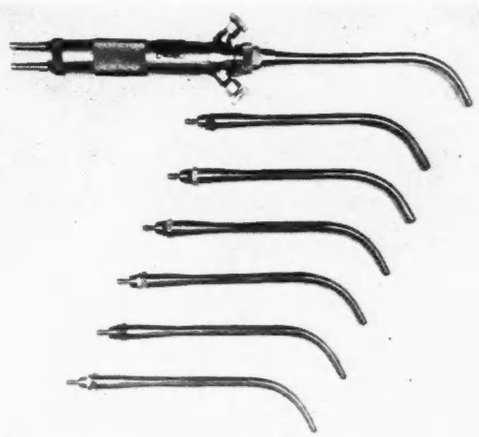
The feed unit contains a second yielding device having ratchet teeth under a very heavy spring pressure, which are designed to yield and sound a warning when the table screw delivers an excessive load. The feed can be engaged only when the spindle is in motion.

The machine can be operated automatically or manually by the selection of proper trip dogs. The entire unit is automatically oiled. The feed screw is 2 in. in diameter and has a special form of thread having a 5/16 in. bearing on each side. It is made of special oil-hardened high-carbon alloy steel and is hardened and ground all over and lapped on the threads. The bronze nut is automatically lubricated under pressure.

The table width is 16 in. and is furnished with varying lengths of feeds, namely, 24, 30, 36 and 42 in. The spindle has an endwise adjustment of 2 in. and a minimum distance of 2 in. and a maximum of 14 in. from the center of the spindle to the top of the table. Micrometer dial provides accurate vertical adjustment, while all cutter adjustments are made with the spindle. Coolant is circulated by a geared pump and a separate motor drive provides 30 gal. of coolant per minute. The entire machine with exception of the table end bracket is automatically lubricated.

Aircraft Welding Blowpipe

OXWELD ACETYLENE CO., 30 E. Forty-second St., New York City, has placed on the market Type W-15 aircraft welding blowpipe, designed espe-

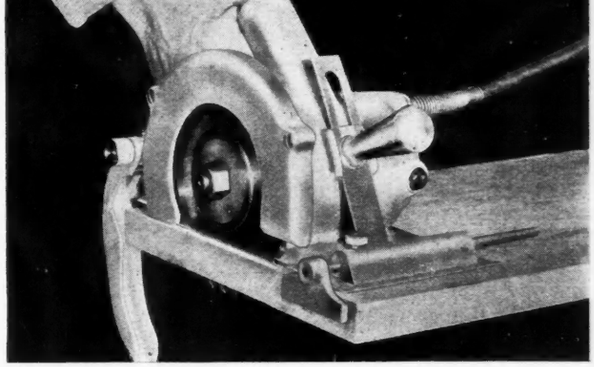


Oxweld aircraft blowpipe

cially for aircraft fuselage welding. It is supplied with seven welding heads, equipped with drawn copper tips to withstand high temperatures and curved to reach the most inaccessible places encountered in aircraft welding. Each welding head is detachable as a unit and each injector can also be detached from the welding head and replaced if necessary. The welding head is connected to the body of the blowpipe with a double conical seat and is held in place with a knurled head nut. The various welding heads are all designed for a constant oxygen pressure of 20 lb. per sq. in. The 3/16 in. oxygen and acetylene hose are connected directly to the blowpipe, the usual screwed hose connections being dispensed with. Valves for adjustment of pressure are placed on the handle in such a position that they can be operated by the thumb and forefinger of the hand holding the blowpipe.

Portable Saw

A PORTABLE saw mounted directly on a special motor armature which runs in two precision ball bearings packed in grease, is the latest development of

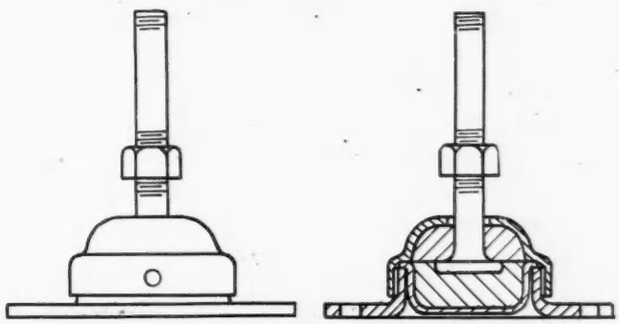


Porter-Cable portable saw

the Porter-Cable Machine Co., Syracuse, N. Y. This arrangement permits the full power of the motor to be applied directly to the saw blades and eliminates all trouble caused by the use of gears, couplings, etc. The saw weighs 10¾ lb., the blade is 6 in. and will cut up to 1⅜ in. There is a depth adjustment for cutting out flooring, slots, etc.

Industrial Shock Insulator

A DEVICE by means of which industrial machinery can be mounted on floors, tables or benches on a rubber cushion is being marketed by the Rubber Shock Insulator Corp. of Bridgeport, Conn., as an in-



Industrial shock insulator in elevation and section

dustrial rubber shock insulator. As shown by the accompanying drawings, it comprises a bolt with flat head, which head is held between two rubber cushions incased in a base and housing made of three steel pressings. One of the pressings forms the base which is secured to the bench or floor by means of wood screws, etc.; a second is in the form of a cup which sets into this base, and the third is in the form of a cap and screws over the flange on the base. Since the hole in the cap through which the bolt passes is considerably larger in diameter than the bolt, there is absolutely no metallic contact between the machine and the base. A demonstration with an electric motor carrying an out-of-balance weight on its shaft and running at high speed, shows the effectiveness of the shock insulator in reducing the transmission of high-speed vibrations from the machine to the supporting floor or bench.

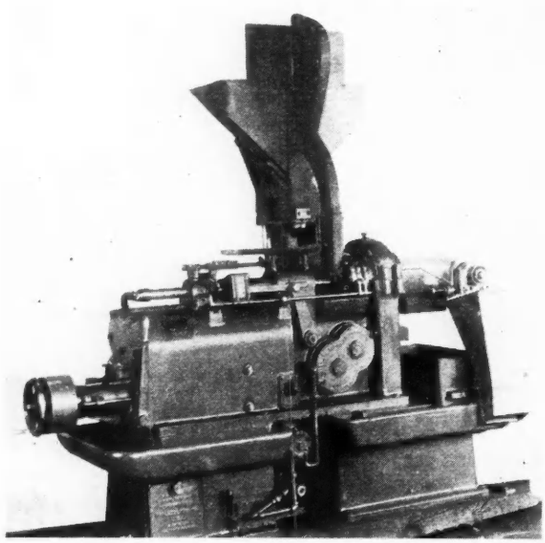
New Stainless Steel

A NEW stainless steel of iron-chromium nickel alloy is being produced in this country under Krupp Nirosta patents and under the supervisory direction of Dr. Benno Strauss, of the Krupp Works, Germany, who first developed this type of alloy. This new material is known as Enduro Nirosta, the principal type being marketed as Enduro KA2. Three companies are licensed to operate under these patents, namely, Central Alloy Steel Corp. of Massillon, Ohio; Ludlum Steel Co. of Watervliet, N. Y., and The Babcock & Wilcox Tube Co. of New York City. These three licensees have organized for joint research and promotion of the product.

Enduro KA2 is resistant to air, water, dilute solutions and acids at high temperatures and at high pressures. It can be deep drawn, wire drawn, spun, readily machined and welded by either electricity or gas. It may be polished to a mirror surface and is non-magnetic and has approximately the ductility of copper. It is now available in all standard forms from the three manufacturers licensed to produce it.

Nut-Threading Machine

THE Automatic Nut-Thread Corp., 3617 N. Eighth St., Philadelphia, has recently brought out a new and larger automatic nut tapping machine, designated as Threadnut No. 3. Its design follows the general lines of other Threadnut machines, but has an hydraulically-operated hopper with plunger feed.

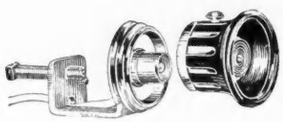


Automatic No. 3 Threadnut

The new machine is fully automatic, the nuts being loaded into a welded, sheet-steel hopper of ample capacity to care for large nuts. A safety clutch throwout is provided to stop the machine should any obstruction prevent the nut being fed on to the tap. After the obstruction is removed the clutch automatically goes back into action again so that the machine can be started by simply throwing the clutch lever in. The taps are of the bent shank design and are held in place in a floating position by a train of nuts on the shank.

The coolant is fed through the plunger under pressure and plays directly onto the tapping jaws and the tap. Change gears are provided which are operated from controls at the end of the machine. Two sets of gears are also furnished to control the speed of the feeding cam. A direct forced feed lubricating system carries oil to all moving parts. Separate reservoirs are provided for the coolant, lubricating and hydraulic oils. Attainable production by this machine ranges from 366 per hour of 1½-in. U.S.S. nuts to 642 ⅞-in. nuts per hour.

Cuno Cordless Dash Lighter



Cuno cigar lighter

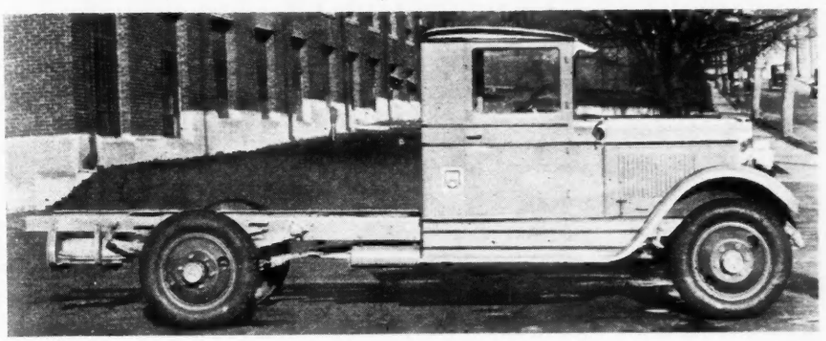
A CIGAR lighter operating from the dashboard has recently been introduced by the Cuno Engineering Corp. of Meriden, Conn. It is of the pass-around type, that is, by pressing the button for a few seconds the heating unit is heated and retains its heat long enough for the plug to be passed around for lighting several cigars or cigarettes. The lighter is installed by drilling a 15/16-in. hole through the dash and the connecting wire and tube are concealed, with only the unit handle and contact button protruding.

DELCO-REMY CORP., Anderson, Ind., has recently developed an electric windshield wiper which is designed for export use and is being sold by Overseas Motor Service Corp., 1775 Broadway, New York. The small powerful electric motor operates either a single wiper or a wiper with tandem attachment and maintains constant speed regardless of engine conditions. Three types of single wiper are available, one for outside mounting on closed cars having the Fisher "VV" type windshield, and for outside mounting on cars with swinging windshields; second, for inside mounting on convertible coupes and other closed cars, and third for inside mounting on open cars. A tandem attachment is available for all these three types.

BROWN & SHARPE MFG. CO., Providence, R. I., has developed a toolmakers' clamp with one long jaw for clamping pieces which a regular clamp will not hold. This new tool, known as the No. 756 clamp, has an auxiliary screw for clamping pieces that the even jaws of the regular clamp will not hold. The extended jaw helps in holding pieces that cannot be gripped otherwise. A spring attachment on the adjusting screw holds the loose jaw in position at all times.

Autocar Replaces Four-Cylinder Trucks With *Sixes*

New "Dispatch" models have capacity rating of 1½ and 2 tons. Hydraulic and mechanical braking systems combined.



New Autocar six-cylinder Dispatch

TWO new six-cylinder truck models have been placed on the market by the Autocar Co. of Ardmore, Pa. These have capacity ratings of 1½ and 2 tons respectively, and they replace trucks of similar capacities fitted with four-cylinder engines. Both new models are referred to as Six-Cylinder Dispatch models and bear the distinguishing mark SA.

Rear axles for both models are of Autocar manufacture, that on the 1½-ton model being of the bevel-gear, and that on the 2-ton model of the double-reduction type. The engines are of Hercules make, with 3¾ by 4½-in. cylinders, and four-speed Brown-Lipe transmissions are used on both models.

The four-wheel braking system comprises Lockheed hydraulic front-wheel and mechanical rear-wheel brakes, the brake effort being proportioned between the front and rear brakes by means of a yoke. The hand-brake lever actuates the same rear-wheel shoes as the brake pedal, slots in the links of the brake rigging taking care of the over-running motion. The frictional area of the four-wheel brakes is 455 sq. in. and that of the hand brakes, 320 sq. in.

In designing the Dispatch models the company's engineers gave the same attention to matters of appearance as they did to mechanical features. A de luxe coupe-type of cab is being built which harmonizes with the chassis lines. This cab has a wood frame and metal panels, and it is provided with a one-piece, ventilating windshield, a metal visor, remote door controls and an automatic windshield wiper. Three-point suspension is employed for the cab, the rear suspension being between two heavy coiled springs. Chromium-plating is used on the radiator shell, the lamps and similar exterior parts.

The gasoline tank is filled from outside the cab, the filler being recessed into the right side of the cab and extending under the seat board to the tank. A gasoline gage is mounted on the instrument board. This instrument board is indirectly lighted and in addition to switches and meters it carries a speedometer.

A two-piece propeller shaft is employed, the first section being practically level. A rubber torque insulator is mounted at the forward end of the shaft and there are metal universals at the center and rear.

Equipment includes an air cleaner, an oil filter, Myers magazine oiler for the clutch throw-out bearing, an electric horn, front fenders and running boards, a spring-type front bumper and a spare rim carrier, in addition to the usual items.

Specifications and prices for the two new models are as follows:

Model	SA-1½	SA-2
Capacity	1½	2
Price	$2,700	$3,000
Wheelbase	150 or 174 in.	150 or 174 in.
Weight, chassis		
Engine	Hercules	Hercules
Size	6-3¾ x 4½	6-3¾ x 4½
Hp.	60@2000 r.p.m.	60@2000 r.p.m.
Carburetor:		
Feed	Vacuum	Vacuum
Gasoline tank	18½ Gal.	18½ Gal.
Ignition	Leece-Neville	Leece-Neville
Radiator, type	Tubular	Tubular
Circulation	Gear pump	Gear pump
Control	Thermostat	Thermostat
Generator and starter	Leece-Neville	Leece-Neville
Clutch	Brown-Lipe	Brown-Lipe
Type	2-plate	2-plate
Transmission	Brown-Lipe	Brown-Lipe
Speeds	4	4
Mounted	Unit	Unit
Universals	1 rubber, 2 metal	1 rubber, 2 metal
Rear axle	Own	Own
Type	Bevel, full floating	Double reduction, full floating
Ratio standard	5.22 to 1	6.33 to 1
Ratio, optional	4.55 to 1 or 6.12 to 1	5.78 to 1 or 7 to 1
Steering gear	Ross	Ross
Service brake	Lockheed int. hydraulic	Lockheed int. hydraulic
	Internal mechanical	Internal mechanical
	Rear wheels	Rear wheels
Hand brake	Internal rear wheels	Internal rear wheels
Drive	Springs	Springs
Torque	Springs	Springs
Springs, front	40 x 2½ in.—11	40 x 2½ in.—11
Rear	54 x 3 in.—9	54 x 3 in.—9
Auxiliary	38 x 3 in.—4	38 x 3 in.—4
Wheels	Steel disk	Steel disk
Frame	6⅞ x 3 x 3/16	6⅞ x 3 x 3/16
Tires, standard	32 x 6	32 x 6, dual, rear
Length, seat to center of axle	63⅝ or 87⅝ in.	63⅝ or 87⅝ in.
Length, seat to end of frame	115¼ or 139¼ in.	115¼ or 139¼ in.
Overall length	223⅛ or 247⅛ in.	223⅛ or 247⅛ in.
Turning radius	48 or 56 ft.	48 or 56 ft.
Rear axle clearance	8¾ in.	8¾ in.

Freedom from shadow is possible with large light sources. Note center of picture where lighting units show around belts, etc. Here quality and quantity of light make class work easier on the eyes

Does *Daylight* Cost More *Than* Artificial Light?

There are many facts indicating that it does and also that seeing conditions under it are inferior.

By Herbert Chase

DAYLIGHT is free and gives ideal illumination; design your factory to admit and use all you can of it." So runs the thesis of the daylight enthusiast. But, like many another booster for particular things, his enthusiasm may have blinded him to cold facts which, if his normal reasoning powers were exercised, might easily lead to other conclusions.

And there are facts which indicate, first, that daylight does not provide ideal illumination for most industrial operations, and, second, that to design factory buildings to use daylight to best advantage may introduce factors which more than offset any gain realized.

This becomes apparent when we enumerate even the generally recognized disadvantages of daylight and is doubly evident when the scientific and engineering phases of the problem are analyzed.

Here are some of the facts commonly known or easily verified:

1. Daylight constantly varies in intensity, from hour to hour and season to season.

2. Daylight is often glaring. Many factories employ shades, blinds or other means to counteract this drawback. The result is a reduction of glare, but at the same time intensity of lighting is reduced so much that only those very near the windows have enough light to work efficiently.

3. Much labor is required to keep windows and skylights clean, and the greater their area and inaccessibility the greater this charge becomes.

4. Modern artificial light presents many advantages over that formerly available.

5. Windows rarely admit enough light to permit of good vision except in bays immediately adjacent to them. Other bays, if used for efficient production, must depend upon artificial light in any case, unless skylights are available.

MUCH attention has been given during recent years to proper factory illumination but seldom has the gauntlet for artificial means been thrown down so positively as it is by Mr. Chase in this article. After a thorough study of illuminating problems, Mr. Chase challenges daylighting to prove its efficiency and maintains that properly designed artificial illumination is not only more economical but provides better working conditions than can be obtained, usually, with unassisted sunlight. Discussion of the premises laid down here is invited.

6. Skylights can serve only one floor. Single-floor buildings cover several times the area occupied by multiple-story buildings affording the same floor space. The single-story building means a higher interest or rental charge per square foot, especially where land values are high.

7. The greater the exposed area, especially that consisting of glass, the greater is the cost of heat required in winter, and the hotter the building in summer. The extra heating charge alone in certain instances may exceed the cost of good artificial light. Buildings with saw-tooth roofs or other sky lighting, in particular, are hard and costly to heat in cold weather and apt to be excessively hot in summer.

8. Some provision for artificial light always is required in any case, and the fixed charges on an adequate system are not materially different from those on a system intended only for occasional use.

This is only a part of the imposing list of facts on the debit side of the daylight ledger. Most of them seem obvious, yet the daylight enthusiast is apt to ignore them or consider them of small moment. Others seldom receive the consideration they merit.

But no debit list in reference to daylight is complete unless it includes items rarely mentioned except in books on physics, optics and related subjects, usually left to the student of science. They are, however, exceedingly practical and equally important. They are not difficult even for the layman to grasp.

Daylight and other "whilte" light appears colorless, but it consists, as we know, of all the colors in the rainbow. Now each of these colors produces a different effect upon the eye. Yellow and green yield the greatest *visual* effect, orange next, blue, violet and red very little.

Orange, and especially red, both very prominent in daylight, are high in energy content. They carry with them much heat which irritates the eye and thus tends to impair vision. Dr. Steinmetz,* in pointing out this fact, observes also that we call red and orange "warm" or "hot" colors while yellow and green are termed "cool," quite in accordance with their energy content.

Human eyes have adapted themselves to these conditions by becoming visually most acute to yellow and green which are properly called the best seeing rays. The eye adjusts itself automatically to admit more green and yellow light when red and orange are absent. It sees best by yellow and green light which actually is easier on the eyes, than in daylight, largely because orange and red are prominent in the latter.

We also see more *clearly* in light of one color. This is because the lens of the eye (though we are not sensible of the fact) splits up all light into its component colors but can focus only one color sharply at a given instant. The other colors reach the retina slightly

* Charles P. Steinmetz, Ph.D., "Radiation, Light and Illumination."

This grinding department requires good lighting for fine quality work. Absence of deep shadows at working points is also of decided advantage

out of focus and tend to blur the image. This effect, called "chromatic aberration," can be corrected in a camera lens but the lens of the eye has no such corrective ability.

When we see objects in daylight, the eye comprises by focusing for yellow-green, the intermediate colors of the spectrum, and, as we have noted, the best colors to see by. The other colors register slightly out of focus and cause the image we see to lack sharpness of detail.

We are so accustomed to this effect that we may never know of it until we chance to see objects in light of a single color (or, what amounts to much the same thing, in light in which two colors of nearly the same wave length, say yellow and green, dominate). Then we note an unusual sharpness of detail giving the impression of magnification. The letters on a printed page, for example, seem to stand out as if engraved or slightly raised.

This is the effect produced under mercury vapor light in which over 90 per cent of the visual effect is due to the yellow-green rays which greatly predominate in this light. With light of this kind an inspector, for example, can see details such as fine flaws or scratches which cannot be seen at all in daylight unless a magnifying glass is employed.

Reflected in Quality of Work

This may seem like a matter of little importance at first glance, but to the worker who may spend eight hours a day 300 days a year in operations demanding good seeing, it is of utmost importance, and, of course, this fact is reflected in the quality and quantity of work turned out.

High intensity is required on special cases. Over 100 foot-candles of light are helping this inspector of rear-view mirrors to rapidly and accurately find defects

The cost of good artificial lighting equipment in automotive production shops seldom exceeds 1 per cent of the cost of the machine equipment it illuminates, while the operation, maintenance and interest charges for lighting generally run below 2 per cent of the labor cost. A good artificial lighting system, therefore, need bring only a very small return to justify its expense, especially since at least a moderately efficient system must be provided in any case for use on short or dark days.

But perhaps the most telling argument of all in favor of a really adequate artificial lighting system is the fact that it enables the investment in a factory to work *efficiently* 24 hours a day, or from two to three times as long per day as it can work efficiently without such a system. Good artificial lighting thus may double the return on a given total factory investment as compared to practically the same investment in a plant in which production must stop or slow down when daylight is inadequate.

Unfortunately many people, who would think differently if they stopped to examine the facts, still labor under the mistaken notion that production under artificial light cannot equal that by daylight. That it can and does do so is evident from the following quotation, which relates only one of many instances that could be cited. The quotation is from an article in *Electrical World* (Sept. 1, 1928), by Jim J. Orr, electrical engineer of the Oakland Motor Car Co.:

"The (Oakland) machine shop is lighted entirely by mercury lamps. These are hung on 13-ft. x 15-ft. centers. The mounting height is 9 ft. 6 in. There are 1800 of these lamps in this one room lighting an area of 400,000 sq. ft. In spite of the size of the installation and the fact that fine machine operations are scattered over the floor, we have never been asked to move or change a light, nor have we heard any complaints of the lighting. *Production efficiency of the night shift has been fully equal to that of the day shift.*"

Humanitarian considerations alone afford ample reason for supplying the best possible light, particularly on close operations, but there is also quite enough justification for doing so on a pure dollars and cents basis.

To sum up, then, we find the case for daylight decidedly less favorable than we generally are led to believe. In quantity, daylight frequently falls short of that desired, while in quality, as regards seeing with greatest clarity, it is inferior to certain forms of artificial light.

It does not follow, of course, that full use will not continue to be made of such daylight as is readily available. It is evident, however, that economy in space and operating costs and the better average seeing conditions which proper artificial light provides indicate a far greater subordination of daylight in the manufacturing picture and a corresponding increase in the reliance upon artificial light. This is not a new idea, but one which keen competition is beginning to drive home in more than one industry.

Whether we accept this conclusion or not, there is such an accumulation of evidence showing that improved illumination speeds up production, that no plant seeking high efficiency and lower costs can afford to continue with an inferior lighting system.

Only one specific illustration need be given here. It concerns a relatively small automotive plant (making polished balls for ball-bearings) where exact records on production increase were available. Similar and often greater savings, however, are realized in plants of any size. Production increase directly attributed to improved artificial lighting was 4 per cent, equivalent to a *net* annual saving of $19.62 per 450-watt lamp or about $17 per employee. This is after making full allowance for interest charges, annual depreciation, renewals, maintenance and current consumed. In addition there was a decrease in spoilage and an improvement in the quality of work turned out.

What is Good Lighting?

Having reached the conclusion that really good artificial lighting pays, we come logically to the question: What primary conditions must be fulfilled for a lighting system to be termed good, judged by modern standards? The answer is not difficult, yet we find the conditions for good lighting violated in a large percentage of instances.

General lighting is here applied to modern straight-line production. Quality and quantity of light have joined to eliminate the troublesome drop-light

The first condition is that the light be adequate in quantity to insure rapid and accurate seeing. The correct quantity varies with the grade of work, the color of material being worked, character of background and other factors. Modern, well-lighted machine shops find an average intensity known as 15 foot-candles quite satisfactory. Where closer work is required, better results are had with intensities up to 25 foot-candles, and inspection work where fine flaws must be detected as much as 100 foot-candles sometimes are found desirable.

Now any modern artificial light suited for production can be supplied in adequate quantity. Care must be used, however, to prevent glare (the second condition for good lighting) and this presents problems, especially when polished or oily surfaces are worked with.

The advocates of incandescent filament lights help to meet this problem by placing the light itself out of the normal range of vision, that is, so that the direct rays do not enter the eye. A reflector, known as the RLM, is employed as a rule and where reflections of the source are bothersome a reflector with a diffusing glass, known as a Glassteel unit, is of assistance. Of course some light is absorbed and lost in the glass globe. Totally indirect systems (those in which all light first strikes the ceiling and is there reflected down onto the work) are even more effective in preventing glare, but seldom are used for production today because of their low light efficiency and the need for constant maintenance.

Advocates of the mercury vapor light contend that it produces no glare, partly because the source is so large that its brilliancy is low (although the amount of light from a single unit is greater than from the usual filament source) and partly because over 90 per cent of the vision produced by this light is from its yellow and green rays. There are sound scientific facts behind these contentions, and these lights are so easy on the eyes that no glass diffusing means are recommended or employed. The reflectors furnished with this light are made almost semi-cylindrical in shape and keep most of the direct rays out of the eye. One can look directly at such a source, however, turn instantly and see fine details without the temporary blinding effect which a glaring source induces. Reflections of this source in polished surfaces is much less tiring than are those from more brilliant sources. This is a distinct advantage, especially in grinding, polishing and other operations where highlights are numerous and sure to tire the eye unless free from glare.

A third condition for good lighting is freedom from dark shadows and from marked variations in uniformity of lighting throughout the working area. The multiplication of small concentrated sources, especially drop-lights, gives spotty illumination and deep shadows, a condition hard on the eyes and not conducive to good vision.

A definite advantage of the mercury vapor-light is that the source itself is large (usually a 1-in. tube 50 in. long) so that light shines around all but very large objects and illuminates the shadows.

Eliminating Eye Strain

The fourth and final item on the list of major conditions for good lighting provides that the light must have those qualities which make for clearest seeing and least eye strain, for it is a recognized fact that workers perform any operation more rapidly and with less spoilage when they can see with greatest clarity and with least tiring strain on the eyes.

To assure this condition in practice it is necessary to apply certain principles in reference to the color and seeing qualities of light referred to in the discussion of daylight. Yellow and green rays are the ones we see by most clearly and light composed largely of these rays has the effect of magnification which we get when "chromatic aberration" is virtually eliminated. White light does not give this condition, largely because orange and red are present in considerable proportions along with the yellow and green.

In this respect the mercury vapor light has an advantage which is recognized and put to good use in a large number of automotive plants.

THE FORUM

Suggests Further Tests With Fixed Clearance Space

Use of combustion chamber with this clearance space not over piston would remove effects of chamber shape on turbulence. Objections offered to plan.

Editor, AUTOMOTIVE INDUSTRIES:

I have been very much interested in the articles on detonation by R. N. Janeway in your Nov. 3 and Nov. 10 issues.

His contention that the merits of the off-set combustion chamber are due entirely to heat transfer, rather than to turbulence, are very interesting, and seem well borne out by the experimental evidence. It occurs to me, however, that a further test along these lines would be of interest, namely, to reverse the positions of the combustion chamber and clearance space so that the thin clearance space is not over the piston. Such a combustion chamber is suggested by the enclosed sketch. This arrangement would entirely eliminate the influence of this combustion chamber shape on turbulence. I can see one very practical difficulty in testing such a combustion chamber, and that would be the difficulty in scavenging the thin portion. Possibly this could be taken care of by some special arrangement, such as introducing a small portion of the fresh charge into the end of this space.

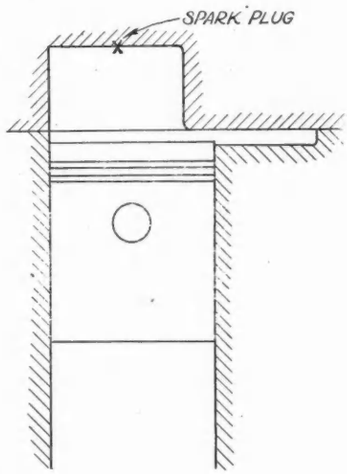
If Mr. Janeway's contention is correct, the overhead valve type of cylinder could be made equally resistant to detonation by providing an attenuated section of the clearance space at the opposite side from the spark plug.

C. FAYETTE TAYLOR.

Mr. Janeway replies as follows to the above letter from Professor Taylor:

The experiment suggested with a fixed clearance space is a logical one but, as foreseen, is practically impossible of clean-cut execution because scavenging of the pocket is necessarily poor and the turbulence in it of a low order. I have tried exactly what is shown in the sketch in both L-head and valve-in-head chambers, and found that combustion apparently was suppressed in the pocket. The results obtained showed a loss in power and a corresponding decrease in detonation.

The lack of turbulence in this dead end is, I believe,



fully as detrimental as the poor scavenging. Turbulence is essential to healthy combustion, not only to accelerate flame propagation but also to promote heat transfer from the unburnt gas. In fact, I lay the beneficial effect of turbulence on detonation to this increase in rate of heat transfer. The effect of turbulence in this respect is twofold. In addition to the effect of the residual turbulence itself (at the time of firing), the increased rate of flame propagation means correspondingly greater rate of displacement of the unburnt gas which also promotes heat transfer.

The point that I tried to bring out in the article is that, while turbulence has a beneficial effect on detonation, it is not the combustion chamber which governs the degree of turbulence, and that the effect on turbulence of a wide variation in chamber shape is, from all evidence, practically negligible.

The simplest and cleanest-cut experiment demonstrating the importance of the clearance space as a cooling device is to compare firing at opposite ends of any off-set chamber. It will be found that firing at the piston end transforms a good anti-knock chamber (when fired from the valve end) into a bad one simply because the gas in the clearance space is burnt at the beginning of combustion and the cooling effect is wasted so far as the last gas to burn is concerned.

R. N. JANEWAY.

Oil Engine Terminology

Editor, AUTOMOTIVE INDUSTRIES:

The frankness with which Captain L. M. Woolson, in your Dec. 22 issue, presents 1200 lb. p. sq. in. as a maximum working pressure in the Packard airless-injection aircraft engine, probably is a landmark in engine development. That pressure is about 50 per cent higher than heretofore has been considered good form in engineering discussion. Presentation of such a working value should arouse thought about matter involved all the way from engines to instruments.

We trust a like courage will eventually come forth in terming the type of engine under development. (Perhaps it may become an "issue" for the S.A.E.!) The word Diesel is probably more convenient than judicious. It doesn't give an instructive picture.

The name of Dr. Diesel has been given to a definite heat cycle, the constant-pressure cycle. It seems logical that his name should remain attached to a result that represents a fulfillment of his labors. But the compression-ignition engine is a live and growing creation, and the terms associated with it should grow and be descriptive in keeping with our enlarging need of directness and dispatch. New engines, new terms; descriptive terms if not too long.

As things now stand we hear of Diesels, semi-Diesels, full Diesels, air-injection Diesels, air-free Diesels, solid-injection Diesels, to say nothing of surface-ignition engines being called Diesels. So the descriptive significance of the term Diesel when used alone, is doubtful.

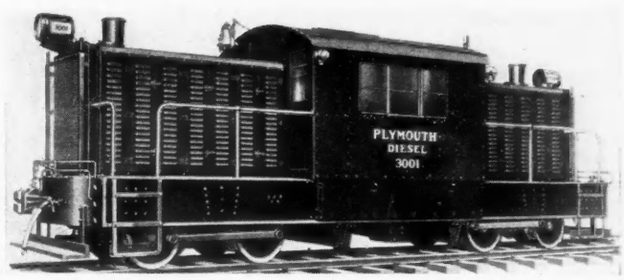
If every engine that uses compression-ignition is to be termed a Diesel, then the word Watt should be tacked to every prime mover using steam expansively. But, let friends of Dr. Diesel remember, the fame of Watt is not diminished because we differentiate by referring to Curtiss and to Parsons turbines. Or more to the point, how often do we hear of the Clerk engine? Furthermore, the unaflow steam engine doesn't carry the name of the inventor of the two-stroke cycle engine. But its name does present a clear-cut picture.

ROBERTSON MATTHEWS.

Diesel Industrial Locomotive

THE Fate-Root-Heath Co. (Plymouth Locomotive Works), Plymouth, Ohio, has recently completed a 60-ton, direct-gear-drive Diesel locomotive. This locomotive is specially adapted for use in general haulage, in quarries, sand and gravel plants, logging, mining, construction work and on short-line railways. It is equipped with an eight-cylinder Winton Diesel engine of 8½-in. bore and 12-in. stroke, developing 400 hp. at 700 r.p.m. The Winton engine is of the airless injection type. Alternately the locomotive may be equipped with two gasoline engines of 200 hp. each. The overall length over the coupler knuckles is 37 ft., and the locomotive is 11 ft. 8 in. high and 10 ft. wide.

The transmission is of the jaw-clutch type and of massive construction. It gives four forward speeds and a reverse. All shafts are of chrome-nickel steel and run in ball and roller bearings. Clutch shifting is accomplished by means of air cylinders. The gears are of alloy steel, heat-treated, and range in size from 11¼ in. diameter by 5 in. face to 34 in. diameter by 8 in. face. Standard speeds are 3, 6, 12 and 24 m.p.h., but the locomotive can be built also with speeds of 4½, 9, 18 and 36 m.p.h. With the standard gearing the tractive force in low gear is 37,188 lb., and with the special gearing, 24,792 lb.

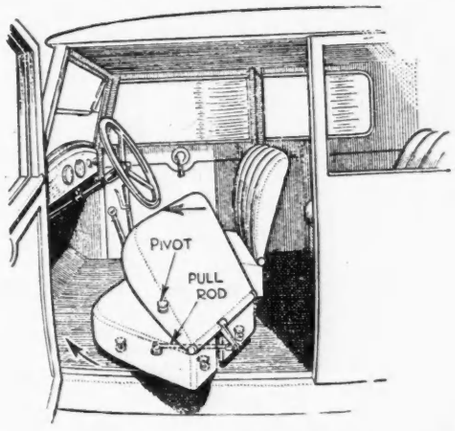


Plymouth Diesel 60-ton locomotive

Equipment includes Westinghouse No. 14 EL double-end-control locomotive brake equipment, two air compressors, electric lights, bell with internal quick-acting bell ringer, chime whistle or Westinghouse pneuphonic horn, automatic couplers, and all safety devices to comply with I.C.C. requirements. In a recent comparative test with an oil-burning steam locomotive, the Plymouth Diesel locomotive consumed 80½ gal. of oil in 13 hours' continuous service.

Rotating Front Seat

A FRONT seat for a two-door sedan body has been patented in England by Louis Renault and we take the accompanying illustration from *The Motor*. In a body of this type it is, of course, necessary to move the near-side front seat out of the way to give access to the rear seats. In American cars these front seats are usually pivoted at the base at their front edge but in M. Renault's design the seat is mounted on four feet, three of which carry casters running on rails, while the fourth constitutes a vertical pivot. The back of the seat is hinged and provided with a lever arm coupled by a rod to an eye secured to the floor. Thus when the back of the seat is pulled forward to fold it down, this action has the effect of rotating the seat as a whole, providing space for entering the rear compartment.



Renault's rotating front seat for two-door sedans

Volume 59 Index

THE Index for Volume 59 *Automotive Industries* from July 7 to Dec. 29, 1928, inclusive, is now ready for distribution to all subscribers who desire it. To those who received a copy of the index to Volume 58 the latest index will be sent without further request.

First with the News

Reliable, Accurate

News of the Industry

PAGE 176 VOLUME 60 *Philadelphia, Saturday, February 2, 1929* NUMBER 5

January Output, Omitting Ford, Placed at 267,939

PHILADELPHIA, Feb. 2—With new car sales reported from 5 to 12 per cent higher in January than for the same period a year ago, dealers throughout the country are optimistic over the prospects for a brisk spring season. In some sections it is reported that unfavorable weather conditions have caused buyers to defer purchases, and this makes the future outlook even more favorable.

Car production of member companies of the National Automobile Chamber of Commerce for January, with the last four days estimated, will total 267,939, it was announced. This figure, which does not include the Ford Motor Co., sets a new January record, exceeding January, 1928, by 15 per cent, and December, 1928, by 124 per cent.

New models introduced during the automobile show season have created wide interest and many dealers anticipate difficulty in obtaining stocks to fill demands when the selling season gets fully under way.

The used car situation varies in different sections. In some eastern cities sales in this class are reported as somewhat slow, while some of the western territories report that used car sales surpass those of new models. Tire, parts and accessory sales are good.

Following are reports on the automotive situation from important centers:

New York

Distributors found January a fairly satisfactory month from the point of view of gaining new dealers during the show. Retailers, however, have found buying in New York City rather disappointing although it is believed that when figures are finally checked up the month will register somewhat better than the corresponding month of last

(Continued on page 182)

"Chrysler Motors" Announced

DETROIT, Jan. 31—Walter P. Chrysler has announced that henceforth the group of manufacturing properties under his personal direction, including the recently-acquired Dodge Brothers, is to be known as Chrysler Motors. "The organization as now set up," he says, "welds together the advantages resulting from the common policy of engineering, purchasing, manufacturing and financing under one personal head."

Hupp to Bring Out Car in $1,000 Class

Four Chandler Lines Will Be Discontinued May 1, Cole Says

CHICAGO, Jan. 29—A new Hupmobile in the $1,000 price class will be manufactured in the old Chandler-Cleveland plant, recently acquired by the Hupp Motor Car Corp., it was announced here today by R. S. Cole, vice-president in charge of sales of the latter organization. Production on the new car will be started about the middle of the year, according to Mr. Cole.

The announcement is the first authentic statement to come from Hupmobile officials since the acquisition of the long-established Cleveland concern. It forecasts the entrance into the highly competitive $1,000 price class field of one of the oldest and most strongly entrenched companies in the industry, with a new car which has been in development for many months.

The new car will be marketed by the Hupmobile retail organization and will bear the Hupmobile nameplate.

The present Chandler line, consisting of four models, will be permanently discontinued about May 1, according to Mr. Cole. It is planned that Hupmobile distributors and dealers will provide mechanical and parts service to present Chandler owners, according to the announcement.

"Opportunity will be given members of the Chandler retail organization located in territory not now having Hupmobile representation to join Hupp," Mr. Cole said.

N. A. C. C. to Hold Motor Truck Show

CHICAGO, Jan. 30—Creation of a National Motor Truck Show was authorized here today by the board of directors of the National Automobile Chamber of Commerce. Details as to time and place are to be arranged by the Motor Truck Division of the N.A.C.C. and will be announced later. It was specified that the show be held in connection with a convention where highway transportation and truck subjects will be discussed by experts.

Buick Distributorship Becomes Factory Branch

CHICAGO, Jan. 30—Plans of the Buick Motor Co. to take over as a branch the distributorship of the late C. C. Coddington at Charlotte, N. C., were announced today by C. W. Churchill, general sales manager of Buick, at the company's headquarters for the National Automobile Show. Dealers in the territory concerned, which includes North Carolina and South Carolina, were informed of the intention of the Buick company at a meeting in Charlotte last Monday evening.

Ford to Rush Plane Output

DETROIT, Jan. 29—A plane a day beginning May 1 is the announced production program of the aircraft division of the Ford Motor Co. The personnel of the airplane factory has been increased from 150 to 1200 during the past year. Present production is three of the large tri-motored all-metal planes a week. During 1928 the company delivered 51 planes.

Locomobile Announces Prices

BRIDGEPORT, CONN., Jan. 28—Locomobile Co. of America, Inc., has announced the following prices for its Model 48 cars: Sportif, $9,600; Roadster, $11,000; Touring Car, $9,600; Touring Limousine, $12,500; Brougham, $12,500; Victoria Sedan, $12,500; Enclosed Limousine, $12,500; Cabriolet, $12,500.

Factory Cooperation Sought by N.A.D.A.

Resolution Asks N.A.C.C. to Assist in Solving Dealer Problems

CHICAGO, Jan. 29—In resolutions adopted here today at the convention of the National Automobile Dealers Association, the National Automobile Chamber of Commerce is asked to appoint a committee of five to serve with a like number from the N.A.D.A. as a Factory-Dealer Relations Conference to discuss cooperation on the following questions:

1. Creating of fund for removal from highways of dangerous and worn-out cars.
2. Greater protection for authorized dealers against infringement by unauthorized dealers.
3. Permitting dealers to take a mark-up on freight equal to the mark-up on motor vehicles and to determine the effect of the addition of net charges to the selling price of the motor car and the advisability of the elimination of such net charges.
4. Determination of a sound policy for pricing motor vehicles of a discontinued model or type.
5. Used car buying and selling methods and actual losses sustained by dealers on used cars in relation to net profit on new cars.
6. Operation costs in relation to discounts, especially as to general increase in cost of rents and operating personnel during the past 10 years as compared to the increase in gross profit, if any.

The National Automobile Chamber of Commerce was asked to share the cost of all meetings and studies.

The resolutions were suggested by Warren E. Griffith, Chrysler distributor at Toledo, who was elected president of the N.A.D.A. for the coming year. Other officers chosen are: J. R. Histed, Hudson-Essex distributor, Chicago, first vice-president; Harter B. Hull, Dodge Brothers, Baltimore, second vice-president; Fred Vesper, Buick, St. Louis, treasurer, and C. A. Vane, general manager.

Glancy Predicts Output Exceeding 260,000 Cars

CHICAGO, Jan. 26—Production and sale of Oakland and Pontiac sixes will touch the highest level in history during 1929, A. R. Glancy, president and general manager of the Oakland Motor Car Co., predicted here before 1000 Oakland-Pontiac dealers at a banquet held in connection with the National Automobile Show.

Mr. Glancy stated that 1929 volume should show a sizable increase even over the 260,000 cars produced by his company during the past year—a record 35 per cent better than in any previous 12-month period in the 22 years the Oakland company has been in existence. The new Oakland All-American Six, he said, despite having been announced during the dull selling season, is rolling up the highest monthly sales figures recorded since the line first came on the market in 1907. The new Pontiac Big Six, similarly, is gathering orders at a rate that assures peak production throughout a good share of the year, the Oakland executive stated.

du Pont Earns $37,929,327 on G. M. Stock in 1928

NEW YORK, Jan. 31—E. I. du Pont de Nemours & Co. report net earnings for 1928 after all charges and after preferred dividends of $58,733,238, of which $37,929,327 was derived from its investment in General Motors. This profit is equivalent to $21.96 a share on common stock and compares with profit of $41,113,968 or $15.45 a share for 1927 when profits from investment in General Motors was $28,941,597.

The company now owns 22.94 per cent of the common stock in General Motors and carries this on its books at $139,737,080, or $35 a share.

U. S. Steel Earnings Up

NEW YORK, Jan. 29—United States Steel Corp. today reported its earnings for the fourth quarter of 1928 as $53,186,679, after taxes, expenses and interest of bonds of subsidiaries. This compares with $52,148,476 in the preceding quarter and $31,247,529 in the fourth quarter of 1927.

Trindl Acquires New Unit

WOODSTOCK, ILL., Jan. 26—Trindl Corp., Chicago, has acquired the Woodstock Motor Valve Co., Woodstock, Ill., but is continuing its operation under the former management. John Whiteworth is head of the Motor Valve company and L. B. Hammond, secretary.

To Open Oakland Foundry

DETROIT, Jan. 26—The new foundry of the Oakland Motor Car Co. is nearing completion and will go into production in February. The foundry comprises 200,000 sq. ft. of floor space and will permit a daily pouring capacity of 450 tons of castings.

Tractor Exports Increase

WASHINGTON, Jan. 30—Exports of wheel tractors from the United States in 1928 showed an increase in value of $10,339,503 over 1927, although the actual number of units moved was smaller, the Department of Commerce announces.

Black & Decker Expanding

BALTIMORE, Jan. 26—Black & Decker Mfg. Co., manufacturer of electric-driven tools, is spending about $250,000 increasing the capacity of its plant. The extension will be financed out of the earnings of the company.

Business in Brief

***Written by the Guaranty Trust Co., New York, exclusively for* AUTOMOTIVE INDUSTRIES.**

NEW YORK, Jan. 31—Trade and industry are still more active than a year ago, despite the unsettled weather in many sections of the country. The cold weather has greatly stimulated the coal trade, although it has hindered building operations to some extent.

LIFE INSURANCE

Sales of ordinary life insurance during 1928 amounted to $8,936,665,000, which represents a gain of 5 per cent above sales during 1927.

CRUDE OIL PRODUCTION

The average daily crude oil production for the week ended Jan. 19 was 2,644,200 barrels, which represents an increase of 50,550 barrels over that in the preceding week.

FREIGHT CAR LOADINGS

Car loadings for the week ended Jan. 12 totaled 914,187 cars. This was an increase of 115,464 cars over those in the week before, which contained the New Year's holiday.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Jan. 26 stood at 97.8, which compares with 97.2 the week before and 97.1 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Jan. 23 were 10 per cent above those in the similar week a year ago.

STOCK MARKET

The stock market experienced a sensational rise in the latter part of last week, and the report of gold shipments into the country augmented the advance. The volume of trading steadily increased during the week, and the wide fluctuations of some stocks caused many new highs to be reached.

There was an increase of $48,000,000 in brokers' loans in New York City during the week ended Jan. 23, but call money remained at 6 per cent.

FEDERAL RESERVE REPORT

The report of the Federal Reserve member banks for the week ended Jan. 23 showed decreases of $127,000,000 in loans, of $245,000,000 in net demand deposits, and of $44,000,000 in borrowings from the Federal Reserve banks.

The consolidated statement of the Federal Reserve banks for the same week showed decreases of $39,700,000 in holdings of discounted bills, of $27,000,000 in holdings of bills bought in the open market, and of $36,300,000 in holdings of Government securities. The reserve ratio on Jan. 23 was 69.3 per cent, as compared with 67.0 per cent the week before.

Executives Speak at Trade Dinner

Annual Event of Chicago Automobile Association Has Record Attendance

CHICAGO, Jan. 26—A note of optimism and enthusiasm was sounded last night at the annual dinner of the Chicago Automobile Trade Association, the event which each year signals the opening of the national automobile show at Chicago. More than 2000 dealers, distributors and factory executives were present, setting what was said to be an attendance record.

The dinner, held in the grand ballroom of the Palmer House, was attended by a number of the industry's leaders, all of whom were emphatic in their predictions of a record 1929 output. It was pointed out by nearly every one present that the Chicago show is notably a selling exposition and each declared the exhibits this year would stimulate sales amounting to many millions of dollars.

It was emphasized that the interest of the public in the products of the automotive industry is at the highest pitch in history and that the indications are the public realizes that its automobile dollar buys more style, comfort, safety, performance and quality than in any other commodity field.

Among those who spoke during the evening were George Graham, vice-president of Willys-Overland Co.; E. L. Cord, president of the Auburn Automobile Co.; J. R. Histed, president of the Chicago Automobile Trade Association and president of the Hudson Motor Company of Illinois, Hudson-Essex distributor; Al Reeves, general manager of the National Automobile Chamber of Commerce; J. E. Fields, vice-president of the De Soto Corp., and Warren E. Griffith, president of the National Automobile Dealers' Association.

Nine Companies Announce New Prices on Various Models at Chicago Show

CHICAGO, Jan. 28—Prices on a number of new models which have been introduced during recent weeks were revealed for the first time at the Chicago Automobile Show. In other instances price readjustments and additions to the lines of various manufacturers were announced. The new prices follow:

STUTZ

L6 Blackhawk

Chantilly 5-p. 4-d.	$2,895
Monaco 4-p. 2-d. coupe	$2,955
Deauville 4-p. 2-d. coupe	$2,955

JORDAN

Model E "6"

2-4-p. Coupe	$1,795
5-p. Sedan	$1,795

Model G "8"

2-4-p. Playboy roadster	$2,695
5-p. Speedboy touralette	$2,895
5-p. Sedan	$2,195
2-4-p. Coupe	$2,195

(Note—No prices have been announced yet on the 6-cylinder touring and eight-cylinder, seven-passenger, sedan models.)

WILLYS-OVERLAND

Willys-Knight "66B"

Roadster	$1,895
Coupe	$1,895
Sedan	$1,895

As an addition to the line of the Whippet 98A models, the two-passenger coupe is now available with rumble seat for $725.

LaSALLE

Spring covers have been added as standard equipment and two-way Lovejoy hydraulic shock absorbers have replaced one-way shock absorbers on the complete line of LaSalle cars. This has resulted in price readjustments averaging a raise of approximately $20 on each model. The prices follow:

Roadster	$2,365
Phaeton	$2,315
Sport Phaeton	$3,035
Family sedan	$2,470
Convertible coupe	$2,615
Sedan, 5-p.	$2,615
Coupe, 5-p.	$2,645
Convertible Landau	$2,745
Sedan, 7-p.	$2,795
Imperial sedan	$2,895
Trans. Cabriolet	$4,820
Town sedan, 5-p. 4-d.	$2,695

CADILLAC

The price of the Cadillac "341" Fleetwood Imperial seven-passenger has been increased from $4,345 to $4,545.

DURANT 40

Touring	$595
Roadster	$595
Sport Roadster	$675
Coupe	$595
Coach	$595
Sedan, 4-d.	$695
Sport sedan	$775

FORD

The Ford Motor Company announced that the roadster with rumble seat has been increased from $450 to $485 f.o.b. Detroit.

PEERLESS

Peerless reduced the price of its new 6-61 coupe from $1,295 to $1,195.

LINCOLN

The seven-passenger Lincoln Limousine was reduced from $5,500 to $5,300 and the Lincoln company also announced the addition of the following custom body models:

Club roadster	$4,900
Convertible sedan by Dietrich	$6,900
Landaulet by Willoughby	$6,100
Convertible coupe by Dietrich	$6,500

Malcolm Appointed Head of Hupmobile Exporting

DETROIT, Jan. 26—R. S. Cole, vice-president in charge of sales for the Hupp Motor Car Corp., announced this week that he has appointed G. N. Malcolm director of exports for Hupmobile. The appointment is effective Feb. 1. F. B. Sides will continue as export manager.

Mr. Malcolm is well known among American exporters of motor cars and has an extensive acquaintence among distributors and dealers abroad. His new work will take him into practically every country on the globe in the interest of Hupmobile. For several years he was in charge of his own company, exporting automobiles to foreign countries and controlling their exclusive sale.

"Hupmobile's export business increased 126 per cent in 1928 over the previous year," said Mr. Cole, explaining the appointment. "We expect another generous increase in the export field in 1929 where the style and design of the New Century Eights and Sixes have met with outstanding favor among buyers in other countries. We feel that Mr. Malcolm's appointment and his extensive experience in other markets will greatly assist Hupmobile's ambitious export program for 1929."

William R. Haggart

MANHEIM, PA., Jan. 26—William R. Haggart, vice-president of the United States Packing Co. and vice-president of the Anchor Packing Co., died recently in Philadelphia after a brief illness. He was 55 years old. In 1898 Mr. Haggart joined the staff of the Garlock Packing Co. and later was one of the organizers of the Anchor Packing Co. He was a director of Roxboro Trust Co., and former president of the Roxboro Country Club.

Franklin Die Officials Predict Bright Future

SYRACUSE, Jan. 26—With its plant working at capacity and bookings running 70 per cent ahead of a year ago, the Franklin Die Casting Corp., subsidiary of the H. H. Franklin Automobile Co., anticipates an excellent year, according to officials at the company's annual meeting.

L. J. Purdy' under whose leadership the company's business expanded during 1928, has been elected president; R. O. Brown, vice-president; J. E. Halligan, secretary; F. A. Barton, treasurer, and R. M. Tennant, assistant treasurer. The board includes H. H. Franklin, president of the Franklin Automobile Co.

Charles N. Teetor, president of the Perfect Circle Co., and Mrs. Teetor with their daughter, Winifred, sailed Jan. 17 from New York for South America.

Steel Mills Taxed by Car Producers

Demand for Finished Sheets Forces Plant Expansion on Makers

NEW YORK—Jan. 31—Pressure on capacity of finishing mills by the heavy demand for full-finished automobile sheets is one of the steel market's outstanding features. Several plants are rushing additions and mechanical extensions to completion to be in a better position for taking care of a larger volume of demand, especially of rush orders. When the continuous strip-mill first attracted attention, there were misgivings here and there lest competition from that quarter seriously retard the growth of demand for full-finished sheets. Experience in the last few months has shown these fears to be unfounded.

While full-finished automobile sheets continue to be the steel market's "best seller," the product of the strip-mills has found steadily growing consumption in the manufacture of parts. In fact with both full-finished sheets as well as strip-mills the problem of late has not been so much one of getting orders as of satisfying buyers who insist upon rush shipments. Expansion of plant capacity to take care of the demand at its peak is being forced upon mills.

Sheet demand from other industries is negligible, as shown by the fact that, while finishing capacity is fully engaged in turning out automobile sheets, there is margin of idle rolls, especially in mills making galvanized sheet. Demand for automotive alloy steels and cold-finished steel bars is good. Prices all along the line are steady and, in fact, come in for very little mention, promptness of shipment being the chief concern of purchasing agents.

Pig Iron—Automotive foundries are melting iron at a good rate, as shown by the rate at which they are eating into first quarter contracts. Some foundries are sounding the market with a view to covering at least their early second quarter needs. Prices hold steady.

Aluminum—Contrary to the general expectation that when copper reached 17 cents an advance in aluminum would be in order, the sole domestic producer continues to maintain the price levels that prevailed throughout 1928. In Europe, consumption of aluminum in place of high-priced copper is on the increase, and the effect of this may be felt before long in the domestic market.

Copper—Metal market gossip has it that the advance in the copper market will not cease until the 18-cent level has been reached when, according to this rumor, the producers plan to peg the price at that figure. The visible supply of raw copper is abundant for years to come. It is refinery capacity that is limited and closely controlled.

Tin—The market seems to be marking time. Developments in primary markets are devoid of any important bearing on prices, and there appears to be somewhat of a lull in the speculative enthusiasm in London.

Lead—Demand from storage battery manufacturers is good. Continuance of the prevailing duty on foreign lead ores has been asked by the producers.

Zinc—The market is quiet. There is talk of ore producers marketing their output through a central selling agency.

Durant Continues New Jersey Plant

CHICAGO, Jan. 30—Frederick J. Haynes, new president of Durant Motors, Inc., revealed today that the company for the time being will continue to operate certain divisions of the Durant plant at Elizabeth, N. J., including the extensive metal stamping division. The engineering department is also still at Elizabeth.

It is planned to establish the working office of the company at Lansing, Mich., but executive offices will be opened in Detroit and Mr. Haynes and members of his immediate staff will spend much of their time there.

Wire Wheel Decision Sustains Injunction

CHICAGO, Jan. 29—The temporary injunction granted to the Wire Wheel Corp. of America against the use of a bolted-on type of automobile wire wheel manufactured by the Budd Wheel Co., was sustained yesterday in a decision by the United States Circuit Court of Appeals for the Seventh Judicial Circuit. The injunction restrains the Overland Motor Co. of Chicago from selling automobiles equipped with this type of wheel. An effort will now be made to have the injunction made permanent.

The present litigation concerns the Cowles patent on automobile wheels demountable at the hub.

Edward G. Budd, president of the Budd Wheel Co., commenting on the decision of the Court of Appeals in Chicago, said:

"The Budd company is much gratified that the disk wheel has been wholly excepted from the litigation and the temporary injunction confined entirely to the wire wheel used by the Overland dealer. Inasmuch as the disk wheel is not only the foundation but the principal part of the business of the Budd Wheel Co., the gratification felt by ourselves and our customers is but natural.

"Moreover, we have every reason to believe that we shall soon convince the courts that the bolted-on type of wire wheels we are now manufacturing should also be freed from the Cowles patent."

C. G. Spring-Biflex Interests Acquired

To be Consolidated in New Company Headed by C. L. Barnes

CHICAGO, Jan. 29—Property and assets of the C. G. Spring & Bumper Co. will be acquired by a new corporation to be formed which will also obtain a controlling interest in the Biflex Products Co., through exchange of stock which has been negotiated through Harris, Small & Co., Detroit bankers, and has been submitted to stockholders of both companies for approval.

Claire L. Barnes, president of the recently consolidated Houdaille-Hershey Corp., will be president of the new corporation which has not yet been named. Charles Getler, vice-president of the C. G. Spring & Bumper Co., becomes vice-president and general manager of the new company. Melvin B. Ericson will continue as president of Biflex and will be a vice-president of the new corporation.

C. G. Spring & Bumper Co. is the largest manufacturer of automobile bumpers in the world and the Biflex Products Co. has for many years been an important factor in the industry. Unusual significance attaches itself to the proposed purchase of the two companies because through it all claims arising under patents against the C. G. Spring & Bumper Co. will be settled and adjusted and all important pending patent litigation will be dismissed. The bumper patents now owned by C. G. Spring & Bumper Co. will be assigned to the American Chain Company, which in turn will grant a license to the new company on advantageous terms.

Houdaille-Hershey Merger Is Approved

DETROIT, Jan. 29—Formal approval of the consolidation of the Houdaille Corp., the Hershey Corp. and the Oakes Products Corp., into a new organization to be known as the Houdaille-Hershey Corp. was voted by stockholders of the three companies at special meetings here yesterday.

All the companies involved in the consolidation have been important factors in the automobile industry for many years and have been engaged in the manufacture of automobile accessories. The Houdaille Corp. manufactures Houdaille hydraulic shock absorbers. The Hershey Corp. manufactures the Hershey coincidental lock. The Oakes Products Corp. manufactures tire carriers, tire locks, motor cooling fans, door handles, etc.

Claire L. Barnes, who has been president of the heretofore separately operated companies, will be president of the new corporation.

Men of the Industry and What They Are Doing

European Trip Postponed by Hambly and Williams

Marmon headquarters at Chicago for the National Automobile Show announced that the proposed trip to Europe by Frank L. Hambly, export manager of the company, and G. M. Williams, president, for the purpose of introducing the new Roosevelt eight, has been postponed until March 1. They expect to be away at least six weeks.

Auburn Appoints Maginnis

Bert Maginnis has become technical supervisor of Auburn Automobile Co., in charge of all service and allied activities. Mr. Maginnis for several years past has been service manager for Teefy-Seltz Co., Auburn distributors in Philadelphia.

Webb to Sell Willys-Knight

John W. Webb, for the last two years Willys-Knight and Whippet distributor in Mount Clemens, Mich., has organized the Webb Garage and Motor Co. to handle Willys-Knight and Whippet in Cincinnati, dealing directly with the factory.

McCarthy Goes to California

O. E. McCarthy, for the last five years connected with the Pierce-Arrow Motor Car Co. of Buffalo, as assistant sales manager at the factory, and director and general manager of the Pierce-Arrow Chicago branch, has resigned this post to become general manager for Col. W. F. Culberson of the Pierce-Arrow Pacific Sales Co., San Francisco, Pierce-Arrow and Oakland distributors in northern California.

Chamber Elects Rentchler

F. B. Rentchler, president of the United Aircraft and Transport Co., and of the Pratt & Whitney Aircraft Co., was elected president of the Aeronautical Chamber of Commerce, at its ninth annual meeting in New York. He succeeds Maj. Lester D. Gardner.

Canedy Made Club President

C. M. Canedy, assistant export manager of the Black & Decker Mfg. Co., Towson Heights, Md., has been elected president of the Baltimore Export Managers' Club for the ensuing year.

Faulkner Gets Directorship

Roy L. Faulkner, vice-president, Auburn Automobile Co., has been elected a member of the board of directors of the Central Body Co., and of the Lycoming Motor Co.

Donner Appoints Robinson

Donner Steel Co., Inc., Buffalo, has engaged the services of H. A. Robinson, effective Feb. 1, as sales representative for all grades of Niagara pig iron in New York City and Philadelphia territories. He will make his headquarters in the New York offices of the company. Mr. Robinson replaces the former representative, A. E. Kelly, who has found it necessary to devote all of his time to his own company, Kelly-Decker Co. of New York City.

Photo by Frank Moore Studio

Charles J. Stilwell

Whose election as a vice-president and a director of Warner & Swasey Co., Cleveland, was announced recently.

Fisk Appoints Slabach

A. W. Slabach, formerly of the Falcon Motor Corp. of Elyria, Ohio, and previously with Dodge Brothers, has been appointed advertising manager of Fisk Rubber Co., with offices at Chicopee Falls, Mass.

Smith Visits East

Wesley D. Smith, president of the Motor Rim and Wheel Service of California, left for the East recently to attend the national convention of Bendix Brake representatives at South Bend and the annual session of the National Motor Rim and Wheel Association, of which he is vice-president.

Dealers Hold Election

MADISON, Jan. 26—C. M. Littleton, president and general manager of the Madison Nash Co., has been elected president of the Madison Automotive Dealers' Association. He succeeds E. F. Jungman, president of the Wisconsin Auto Service Co. Other new officers are: Vice-president, Oscar Kampen, president, Blackhawk Motor Co.; secretary and treasurer, Roy E. Andrew, president Pennsylvania Oil Co.

Michigan Group Elects Its Officers for Year

DETROIT, Jan. 26—At the convention of the Michigan Automotive Association here this week the following officers were elected for the year: Alfred B. Perfet, Ford dealer of Port Huron, president; Harold J. Allington, Hudson-Essex dealer of Saginaw, vice-president, and John W. Neumann of William F. V. Neumann & Sons, Detroit Pierce-Arrow distributors, treasurer. H. H. Shuart, manager of the Detroit Automobile Show, was reelected secretary.

Change California Staff

Changes in the district office staff of the California State Automobile Association have been announced by F. V. Dewey, Jr., field secretary. C. O. Scott, manager of the Santa Rosa district office, becomes assistant secretary of the Arizona association and is succeeded by N. W. Moodey, manager of the Eureka office. R. D. Maclean, manager of the Siskiyou County office at Yreka, goes to Eureka, and J. B. Ragatz, of the Vallejo office staff, takes the Yreka office.

Russell Promotes Conroy

W. T. Palmer, manager of the Russell Mfg. Co., has announced that R. W. Conroy, formerly assistant manager of the company's branch at San Francisco, has been appointed aero sales manager of the replacements department. Mr. Conroy will have his headquarters at the factory in Middletown, Conn.

Taylor Made Plant Executive

William Taylor, Ardmore, Pa., has been appointed assistant works manager of the Autocar Co. plant. This position makes him directly responsible for all production under F. W. Ayers, works manager.

Durant Appoints Shorter

R. T. Hodgkins, new general sales manager of Durant Motors, Inc., announces the appointment of H. J. Shorter as assistant general sales manager. For the past year Mr. Shorter has been assistant sales manager of the Durant Motor Co. of New Jersey in charge of sales in the Eastern United States.

Thomas Takes New Position

G. C. Thomas, manager of the Charlotte branch of the Carolina Cadillac Co., of Winston-Salem, N. C., since 1910, has gone to Asheville, N. C., to assume the management of the recently organized Thomas Cadillac Co. A five-story building has been leased for use as quarters of this company.

Grant Urges Caution in Used Car Deals

Factories Favor Safe Limit on New Car Sales, He Says

CHICAGO, Jan. 29—R. H. Grant, vice-president in charge of sales, Chevrolet Motor Co., speaking here tonight at the banquet of the National Automobile Dealers Association, said: "There is a breaking point in handling used cars in their ratio to new car sales volume beyond which the dealer cannot go and make a profit. We as manufacturers do not want new car volume that comes from going beyond this point.

"It behooves every dealer to know the point at which he can safely balance used car trades with new car volume attained at a profit. If he goes beyond this point he will fail and we do not want dealers to fail. We want them to make money.

"We want them to set up the proper organization of man power to attain the nearest possible perfection in potential sales in their territories. Some time an economic balance must come as to the number of new cars that can be produced in this country. We as factories will get nowhere by coercion, but we will go far by cooperation."

Grant outlined what has been accomplished by the Chevrolet junking plan and recommended that all dealers set up a controlled junking fund to eliminate the junked car from further trading and from the highways.

Plan Meetings to Help Truck Equipment Makers

PHILADELPHIA, Jan. 26—Arrangements are being made by the Committee on Sectional Divisions of Equipment for Motor Trucks, Inc., to hold meetings in 30 of the larger cities of the country within the next 60 days. This effort is said to be in line with the policy of the association to aid the equipment industry in its local and sectional problems. The fifth annual meeting of the organization is scheduled to be held in Detroit on the third Monday in September.

Truck chassis manufacturers, as well as officials responsible for fitting the chassis with bodies and equipment and representatives of the sales division, are invited to the annual meeting to discuss their problems with body manufacturers and distributors.

Demand for Fabric Body Found Waning in England

LONDON, Jan. 26—The opinion expressed in the Olympia Show report published in *Automotive Industries* last autumn, that, although many more British manufacturers had standardized a fabric sedan to supplement other types of bodywork, the popularity of the fabric type was tending to wane, has received confirmation in a statement published relative to Wolseley cars.

It is said that the makers have been embarrassed owing to the fact that when the 1928-29 program was arranged it was estimated that the demand for fabric and metal-panelled sedans respectively would be approximately equal. Owing to the falling-off in the popularity of the fabric type, the present demand for metal-panelled bodies is said to govern 80 per cent of the output.

Bus System Formed in $1,000,000 Deal

TOLEDO, Jan. 29—A new transcontinental bus system said to rival the Greyhound lines was formed here this week when Nevin Bus Lines, Inc., of New York, large eastern operators, purchased the Silver Arrow line, operating from Detroit to Pittsburgh via Toledo and owned by Toledo capital; the Paradox Line, owned by Swerer Brothers of Denver, and operating between Kansas City, Denver, Salt Lake City, Casper and Cheyenne, Wyo., and Continental Stages, Inc., of Chicago, owned by T. J. McManus and operating between Pittsburgh, Chicago and Kansas City.

About 285 buses were involved in the deal which was said to represent about $1,000,000. Bus interests here have heard that the merger is the forerunner of competition between large railroad interests to control transcontinental and interstate bus business.

Nagel Has 70 Stations

TOLEDO, Jan. 29—Nagel Electric Co., makers of a line of heat indicators, gasoline gages, and similar equipment for automotive, airplane and motor boat industries, has established 70 central service stations throughout the country, it was announced by Fred N. Dodge, sales manager, at a meeting here this week of the men who will have charge of these stations.

Whitaker in Dart Truck

Jack Whitaker, president of the Whitaker Battery Supply Co., with factories in Kansas City and in Philadelphia, has bought a large block of stock in the Dart Truck Co., Kansas City, and has been made vice-president of the company.

Duncan G. Stanbrough

DETROIT, Jan. 29—Duncan G. Stanbrough, 50 years old, prominent in the automotive field here and in the east, died yesterday in his home after a short illness. At his death he was assistant to Walter Briggs, chairman of the board of the Briggs Mfg. Co., and was head of the LeBaron custom body division of the Briggs firm. He was vice-president of the Towson Body Corp. for four years.

Financial Notes

Continental Motors Corp. has voted to issue an additional 352,169 shares of no par common stock for the purpose of retiring $6,215,300 worth of outstanding 6½ per cent gold bonds of the company. Shareholders of the company of record Feb. 2, will be extended the privilege of subscribing to this additional stock on or before March 5 at $17.50 a share on the basis of one share of additional stock for each five shares held.

Stewart-Warner Corp. has reported net income for 1928 as $7,752,532 or $12.92 a share as compared with $5,210,053 or $8.67 for the preceding year. The plan voted by the directors last week, recommending that authorized capital be increased from 600,000 shares of no par value to 2,000,000 shares at $10 par and that existing stock be exchanged for new on the basis of one share of new for one of old, will be submitted for vote of the stockholders at the annual meeting April 2.

F. B. Goodrich Co. has declared regular quarterly dividends of $1 on common and $1.75 on preferred stock, payable March 1 and April 1 respectively to stockholders of record the 8th of the previous month. The company reports net earnings for 1928 of approximately $3,500,000 after all charges including payment of preferred dividends. This is equivalent to $1.48 on common stock and compares with $11,780,306 or $15.44 a share for 1927.

Commercial Investment Trust Corp. reports net profits for 1928 as $5,278,263 as compared with $3,003,392 for the preceding year. This is equivalent, after preferred dividends, to $9.71 a share on outstanding common stock, and compares with $4.89 in 1927. Bills and accounts purchased during the year reached a total of $282,163,859 as compared with $188,271,263 for 1927.

Hall Lamp Co. has announced 1928 net profits of $1,027,332 after charges and Federal taxes, equivalent to $2.57 per share on the outstanding stock. This will compare with $430,773 in 1927 or $1.07 per share on the stock then outstanding. The balance sheet as of Dec. 31, 1928 will show quick assets of $4.11 per share.

Checker Cab Mfg. Corp. and subsidiaries report for the year 1928 net profit of $1,218,648 after all charges, equal to $4.87 a share on 250,000 average shares of no par common stock outstanding during the year. Net profit for December was $265,905.

Mullins Mfg. Co. reports earnings for 1928 after all charges as $728,531. This is equivalent to $6.52 a share on common stock after payment of preferred dividends and compares with $588,709 or $5.12 a share for the preceding year.

Electric Autolite Co. has reported gross business for December as $2,052,000 as compared with $698,000 for December of 1927.

Marmon Motor Car Co. has declared a regular quarterly dividend of $1, payable March 1, to stockholders of record Feb. 15.

Retail Sales Continue Favorable

(Continued from page 176)

year. Stocks of new cars seem to depend largely on the line. Some dealers are still disposing of stocks of last year's models while waiting for the arrival of new models, whereas others are becoming rapidly overstocked in new models. The used car stocks are similarly varied.

CHICAGO

Retail sales were approximately 10 per cent ahead of January, 1928, and, although weather conditions have been very severe during the month, sales showed a substantial gain over December. New car stocks are low with practically no hold-overs. Although used car stocks are high they are not considered abnormally so for this season of the year.

DETROIT

The Secretary of State's office reports new car registrations in the greater Detroit area as three times as great as last year, although used car sales are considerably slower than new car sales. Many dealers, whose companies have just announced new models, are experiencing difficulty in obtaining cars while in other instances new car stocks are plentiful. Used car stocks are fairly heavy. During the first 23 days of January more license plates were issued in Greater Detroit than during the first three months of last year.

ATLANTA

January started off with sales better than last January and the outlook for new car sales this spring is good. Used cars, however, are being sold by most dealers at sacrifice prices with an abnormal number on the market. New car stocks are about normal. Trucks are selling well with January volume fully as in January, 1928. Advance orders for dimension lumber from automobile factories and body plants indicate manufacturers are looking for a big season.

BOSTON

January proved a much better sales month for new cars than December. On the other hand, the used cars have been moving slowly. It has been possible to draw people to the dealers, but they have not been keen about buying. In the middle of the month cold weather and snow kept buyers away. Toward the end of the month it was slightly better. Dealers are not placing orders with distributors for any large quantities of cars now. The repeal of the tax law is not having much effect in stimulating sales.

CLEVELAND

Sales are maintaining the seasonal average. With the opening of the annual automobile show here a sharp increase in sales was expected to send the total to new levels. While exact figures were impossible to obtain it was reported that new and used car stocks were fairly small.

CINCINNATI

Dealers are optimistic despite the fact that January sales for the first 21 days were eight per cent below those for the same period last year. A two per cent decrease in used car sales also was shown. Unusual interest in the annual show, however, and the orders booked and prospects obtained, assures a steady demand until the spring season. Dealers are in good shape as regards inventories in both new and used cars. Parts and equipment and tire dealers generally report conditions especially good for the season.

MINNEAPOLIS

While sudden snow and cold weather has held back deliveries in the country, business as a whole is better than last year. Orders for retail delivery are being received generally and are being filled where traffic is possible. Used car sales are slowed up but practically no stocks are on hand. New car stcoks are not accumulating, distributors being asked to take only what they are disposing of.

DALLAS

Automotive business in this section for January is much better than a year ago. Retail sales show 12 per cent increase and the outlook is bright. The heaviest business is in low-priced cars and dealers are having trouble making immediate deliveries on some models. Ford deliveries are improving. New car stocks are not as heavy as a year ago, while used car stocks are rather heavy with prices low.

NEW ORLEANS

The outlook is better than at any time within the past three years. The used car market particularly is in good condition, with but few dealers over-stocked. Large municipal building programs, flood control expenditures and other revenues have brightened the outlook here. Ford and Chevrolets seem to run even in the light car market. Tires and accessories are starting off better than for the same period of last year.

KANSAS CITY

Despite a series of blizzards, January sales will equal or exceed those of January, 1928. Dealers with recent models report steady buying. There has been a shortage of several makes, particularly the new line of Whippets and Willys-Knights. Chevrolet dealers also have been unable to fill orders.

New car stocks are somewhat below average. Ford dealers are able to make immediate deliveries. Used car stocks are low for this season.

SEATTLE

Retail car sales for January were five per cent ahead of last month, and from 10 to 12 per cent higher than sales for January, 1928. The outlook for the first quarter of 1929 is very good, and dealers feel that sales in the first quarter will run from 10 to 15 per cent higher than the first three months of 1928. Stocks of new cars are normal for this season of the year. The used car market is exceptionally good for this time of year. Credit conditions are good, and repossessions normal.

DENVER

Unusually severe weather during January resulted in business being less than in the same period last year. Also, many new models being anticipated slowed buying. Used cars moved well and stocks are light with few repossessions. Outside of the city territory sales are slow on account of a poor farm year, low prices and lack of market.

MILWAUKEE

Despite the handicap of the most severe weather in years, there has been a favorable sale of passenger cars in January, and dealers expect to see an increase over last January, when the entire state absorbed 3438 new cars, according to official registration figures. The Milwaukee show, Jan. 12-19, is said by all dealers to have been productive of more business than any previous exposition. Stocks of both new and used cars are reported to be in fairly satisfactory balance.

OAKLAND

Business conditions in the automotive industry in northern California for January show a slight increase in sales, not more than 5 per cent over January of 1928. Sales for January are approximately the same as in December, 1928. The business outlook for 1928 is good with dealers optimistic. Stocks of new and used cars now on hand are slightly larger than a year ago.

LOS ANGELES

Southern California January sales are expected to show slight decrease under January last year, although most distributors look for good early year business. Used cars continue to move well while general business conditions are reasonably good. The truck market is fair.

Shipment of 142 in Day Sets New Peerless Mark

CHICAGO, Jan. 30—L. R. German, president of Peerless Motor Car Corp., announced tonight at the Peerless dealers' dinner, held in connection with the National Automobile Show, that the company had obtained 8236 orders at the New York show and that thus far in the Chicago show 56 dealers had been signed up in response to activities in connection with the "Peerless Prosperity Program" for 1929.

Daily production at the company's Cleveland plant is 70 cars, Mr. German said, and it is expected to step up the schedule 100 a day by March 1. The official announced that, with production thus far in January at 1200, Peerless plans to build 12,000 cars this year. The banner day in the company's history for shipments was Jan. 24 when 142 cars left the plant. Supporting the Peerless program is a $1,000,000 advertising appropriation of which one-half is to be spent during the first six months of 1929, according to Mr. German.

H. O. Smith Resigns

WASHINGTON, Jan. 31—H. O. Smith resigned today as chief of the automotive division, Department of Commerce. Mr. Smith plans to leave for Florida next week and has made no announcement as to his plans for the future. His successor has not been named.

Pines Winterfront Erecting New Plant

Two-story Structure to Provide Several New Features for Saving Money

CHICAGO, Jan. 28—Pines Winterfront Co. is erecting a new $3,000,000 plant with a frontage of 447 ft. on North Cicero St. and 425 ft. on Division St. The greater part of the factory will be two stories tall, with every part of the walls possible used for windows. The second floor will be covered by practically a continuous skylight. A feature of the structure will be a 120-ft. tower, the top of which will house a water supply tank while space below will be devoted to storage of the company's sales and corporation records.

The ground floor will be given over entirely to production machinery and the tool department while executive offices, finishing rooms and experimental laboratories will be housed on the second floor. The plant will also be equipped with a large chromium-plating department for the plating of radiator shells.

Another feature will be facilities for loading and unloading freight cars inside the building, which is expected to save the company considerable money. In the matter of sheet steel, which reaches the plant with a very highly polished surface, the company expects to save $50 a carload and 24 hours of time now required to repolish it.

Elect Hugh Lyons Officers

DETROIT, Jan. 28—Barrett Lyons was chosen secretary and treasurer of the Hugh Lyons Co. and was the only new member added to the board of directors at the annual meeting of stockholders. H. D. Luce, former secretary and treasurer, was made first vice-president, while A. E. Lyons was reelected president; H. G. Hughes, second vice-president, and B. A. Moore, assistant treasurer. The board of directors is composed of A. E. Lyons, H. D. Luce, E. F. Cooley, Elgin Mifflin, Plummer Mifflin, B. A. Moore, H. G. Hughes, and Barrett Lyons.

Predict $145,580,680 for New Buildings

NEW YORK, Jan. 28—In its annual forecast of building construction in this country for 1929 the Architectural Forum has placed $145,580,680 as the value of such projects in the automotive industry, with the total value of all new building construction, under architectural supervision, as $5,116,773,200.

Dividing the country into six parts in its forecast the publication predicts the greatest building operation in the automotive industry for the Middle States, the value forecast being $56,322,200. The lowest estimate is made for the Southeastern States, $7,447,000. Estimates for the other four given sections of the country are: North Atlantic States, $42,132,200; Western States, $14,539,800; Northeastern States, $14,469,400, and Southwestern States, $10,670,000.

DeVilbiss Co. Headed by Late Founder's Nephew

TOLEDO, Jan. 26—The reorganization of the DeVilbiss Company, of Toledo, Ohio, following the death of the founder and president, Thomas A. DeVilbiss, finds Allen D. Gutchess, a nephew of Mr. DeVilbiss, in charge of the industry which during the lifetime of Mr. DeVilbiss grew from an obscure position to an organization represented in all the markets of the world, supplying spray painting, finishing systems and other products to all civilized countries. Mr. Gutchess, who is 35, went to work for his uncle at the age of 14.

Other new officers are: W. M. Booker, chairman of the board; F. A. Bailey, vice-president and general manager; W. F. Gradolph, general sales manager; F. C. Penoyar, secretary; W. W. Conklin, treasurer, and Howard DeVilbiss, son of the founder, assistant secretary.

Jackson Predicts Record for Hudson

Year's Earnings $13,457,364; New Six Months' Schedule Demands 240,000 Cars

DETROIT, Jan. 28—The outlook for business in first half of 1929 is by far the best the Hudson Motor Car Co. has ever known, R. B. Jackson, president of the company, has announced in his annual report to stockholders. Net earnings for 1928, after all charges and taxes, were $13,457,364—or $8.43 a share on the 1,596,660 shares outstanding. While this was a moderate decline from 1927 when $9.04 a share was earned, the company's cash position gained $6,728,679 showing $20,014,640 in cash and U. S. treasury notes Dec. 31, 1928.

"Since showing the Hudson and Essex 1929 models," Mr. Jackson said, "we have experienced an unprecedented demand for both cars. In the first quarter we will ship over 110,000 cars and for the first six months our schedule is 240,000 cars. Gross for the first quarter of 1929 will be over $70,000,000. In spite of this there is every indication we will be short of demand.

"In the United States and Canada more than 5000 distributors and dealers sell Hudson and Essex cars; throughout the rest of the world are 2000 other distributors and dealers. Export trade is handled both by direct shipments to dealers and through our export assembling plants located in England, Germany and Holland. Export distributors have their own assembling facilities in Australia, New Zealand, Poland, South America and in many far East points.

"Export trade is increasing rapidly and this year will total 50,000 units. Hudson's export proportion to its 1928 shipments was 13 per cent; the proportion of all other American manufacturers was 10 per cent. In 1928 Hudson-Essex cars exceeded one-half of all American passenger cars imported into Great Britain."

Estimate G. M. Earnings in Quarter $38,565,000

DETROIT, Jan. 31—It is estimated that earnings of General Motors Corp. for the fourth quarter of 1928 were $38,565,000, or $2.08 a share on 17,400,000 old common shares and 83 cents on 43,500,000 new common shares, before preferred dividends. On this basis profits for 1928 reached the record-breaking total of $279,100,000, which is equal to $15.50 on old common and $6.20 on new common, after preferred dividends, compared with $235,104,826 or $12.90 a share earned in 1927.

In the final quarter of 1927 the earnings were $41,346,524 or $2.24 a share on 17,400,000 common shares and 90 cents a share on present 43,500,000 new shares.

Shortage of Cars in Dealers' Hands Results in Lower General Motors Sales, Says Sloan

NEW YORK, Jan. 29—Owing to a shortage of cars in the field, deliveries to consumers by General Motors dealers in December totaled only 33,442 units as against 53,760 for the corresponding month of 1927, according to an announcement by Alfred P. Sloan, Jr., General Motors president. Sales by General Motors manufacturing divisions to dealers totaled 35,441 cars, compared with 60,071 for December, 1927.

Sales to consumers exceeded sales to dealers for the fourth quarter of 1928 by 61,081 cars, resulting in a reduction of field stocks by this amount. This condition was made necessary by a change in models of several of the corporations' quantity producers.

For the entire year 1928, sales to consumers were 1,842,443 cars, exceeding the previous year by 287,866 cars, or 18.5 per cent. General Motors divisions sales to dealers in 1928 were 1,810,806 cars, exceeding the previous year by 248,058 cars, or 15.9 per cent.

Parts and Accessory Sales Show Gains

NEW YORK, Jan. 26—Parts and accessory business for 1928 was much better as a whole than in the preceding year, according to the Motor and Equipment Association, whose indices on sales for the year have just been computed by figuring January 1925 on a basis of 100.

On this basis the index for 1928 is 184 as compared with 146 in 1927 and 137 in 1926. The last quarter, while showing the usual depression in most groups toward the close, was much more satisfactory in volume of business than the last quarter of the preceding year. Grand index for December was 151 as compared with 153 for November and with 109 for December, 1927.

Original equipment in December, 1928, showed an improvement over November with an index of 164 as compared with 163 and with 111 in December of 1927. The year's index in original equipment was 199 as compared with 150.5 for 1927 and 139 for 1926.

Other groups showed the usual decline in December but with the exception of accessories all showed an annual index higher than previous annual indices. The December index in replacement parts was 131 as compared with 149 for November and 126 for December of the previous year. The year's index in replacement parts is 155 as compared with 135 in 1927 and 124.33 for 1926.

Space at Aircraft Show Reserved by 118 Firms

DETROIT, Jan. 26—With the opening of the All-American Aircraft Show at Detroit still almost three months away, reservations for space have already exceeded the total of last year's show. Up to Jan. 23, 45 airplane manufacturers had reserved space for the exhibition of 81 planes. Ten engine manufacturers reserved another 3000 sq. ft., while reservations were received from 63 accessories manufacturers.

It is expected that among the products to be exhibited for the first time will be the Packard Diesel aircraft engine, providing all preliminary tests of the engine have been completed by that time. Among those who will make their first exhibits at an aircraft show are: Cunningham-Hall Aircraft Corp., Rochester; Invincible Metal Co., Manitowoc, Wis.; and R. A. Rearwin, Airplane Co., Salina, Kan. The show will be held April 6-14.

Coming Feature Issue of Chilton Class Journal Publications

Feb. 23—Statistical Issue Automotive Industries.

United Aircraft Expands

NEW YORK, Jan. 26—United Aircraft and Transport Corp., recently organized to include the Boeing Airplane and Transport Co., Pratt & Whitney Aircraft Co., and Chance Vought Corp., has just acquired control of the Hamilton Aero Mfg. Co., and the Hamilton Metalplane Co., both of Milwaukee. The Aero manufacturing company makes aircraft propellers.

New Lubricant Announced

NEW YORK, Jan. 26—Pioneer Instrument Co., Brooklyn, announces it has produced a lubricating oil for airplane instruments which will function in temperatures down to 40 deg. below zero, Fahr.

Experimental work for developing this oil was started by the late Morris Titterington of the Pioneer company at the suggestion of Sir Hubert Wilkins. The Pioneer company has named the new lubricant Wilkins oil, in honor of Sir Hubert.

Tires to Have Long Test

NEW YORK, Jan. 26—A fleet of 15 cars of various makes, all equipped with Goodrich Silvertown tires, and painted in silver, left City Hall here this week in the beginning of cross country run, during which it is planned to subject the tires to every conceivable kind of road condition. This run, which is being staged by the B. F. Goodrich Rubber Co., will carry the cars down into Florida, across into California, and then back to New York.

Employees of G.M. Receive $13,968,800

DETROIT, Jan. 28—Alfred P. Sloan, Jr., president of General Motors Corp., has announced that $13,968,800 will be distributed by the corporation to its employees this week, through its Savings and Investment Fund, Class of 1923. The contribution is to consist of $2,194,000 in cash and 147,185 shares of General Motors new common stock.

Each employee who during 1923 paid into the fund $300 of his wages is to receive approximately $415 in cash and 27 shares of stock having a current market value of about $80 a share, Mr. Sloan explained. This savings plan is one of several maintained by General Motors, including housing for employees, seven per cent stock investment plan, group insurance, bonus for salaried employees and managers' securities plan for senior executives.

The Savings and Investment Plan, which was introduced 10 years ago, provides for annual classes which permit employees of three months' standing to set aside 20 per cent of their annual salaries or wages, not to exceed $300 in one year. Five years after a class is formed the cash saved by the employee, plus interest compounded semi-annually at six per cent and the accumulated common stock, in which the money was invested, is distributed. At present 156,000 employees, or 90 per cent of the eligibles, are participating.

Piston Ring Co. Reports Shipments of 50,495,177

DETROIT, Jan. 26—Piston Ring Co. of Muskegon, shipped 50,495,177 piston rings during 1928. Of this 33,564,965 were handled by the manufacturing division while the rest passed through the service division and was handled as follows: Domestic, 15,467,839; Foreign, 1,462,373.

As a result of new contracts which the company has entered into with a number of manufacturers it is expected that the 1929 volume will far exceed that enjoyed during the past year. The company recently announced it had received an order from the Ford Motor Co. for all Ford Model T replacement rings in addition to a large order which it had held for Model A business.

Calendar of Coming Events

SHOWS

All-American Aircraft Show, Detroit Board of Commerce, Detroit..Apr. 6-14
Automobile Salon, Inc., Hotel Biltmore, Los Angeles.....Feb. 9-16
Automobile Salon, Inc., Palace Hotel, San Francisco ... .Feb. 23-Mar. 2
Boston, Mass., Mechanics Bldg...March 2-9
Geneva Automobile Show .....Mar. 15-24
Leipzig, Germany, Fair.....Mar. 3-13
Melbourne Automobile Show.....May 2-11
Rome Automobile Show.....Jan. 30-Feb. 16

CONVENTIONS

Fifth Annual Army-Navy Standards Conference, Naval Aircraft Factory, Philadelphia .....Feb. 11-14
Marketing Executives Conference, Hotel Gibson, Cincinnati .....April 3-5
Annual Meeting, National Foreign Trade Council, Baltimore....April 17-19
Chicago Power Exhibition and Conference, Coliseum, Chicago....Feb. 12-16

RACES

Akron .....May 12
Indianapolis .....May 30
Detroit .....June 9
Altoona, Pa. .....June 15
Salem, N. H. .....June 29
Akron .....Aug. 18
Syracuse .....Aug. 31
Altoona, Pa. .....Sept. 2
Cleveland .....Sept. 15
Salem, N. H. .....Oct. 12